

CONTRACTOR : ABB CONTRACTING COMPANY


CLIENT : SAUDI ELECTRICITY COMPANY, CENTRAL TRANSMISSION AREA

PROJECT : CONSTRUCTION OF 380/132/13.8kV BSP # 9020 KING ABDULLAH FINANCIAL CENTER

SUBSTATION : S/S 9020

CONTRACT NO. : 11033009/00

TITLE : PROTECTION LOGIC DIAGRAM-132kV

| | |
|---|--|
| Saudi Electricity Company | |
| CTA Projects Department | |
| <input type="checkbox"/> Approved | SIGN  |
| <input checked="" type="checkbox"/> Issued by | SYED ZAFULLA-MALGIMANI |
| | 31-07-2012 |
| <input type="checkbox"/> Disapproved | 12/91226/12021001 |
| | 23-07-2012 |
| SEC Date | |



| ABB PROJECT NO. | ABB SHT NO. |
|-----------------|---------------------|
| S-12926 | SHEET 000 CONT. 001 |

| AS-BUILT BY _____ DATE _____ | | | | | |
|------------------------------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 25 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91083 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |

DRAWN BY TSR CHECKED BY NSR

DATE STARTED 06/10/2010 DATE COMP _____

DPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM

| COVER SHEET | |
|--------------------------------------|-------------------------|
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| الشركة السعودية للكهرباء Saudi Electricity Company | | | | | SHEET NO. |
|---|-------|-----------|----------------|----------|-----------|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. | 01 of 54 |
| N/A | P | C292 | CD-176662 | 07 | |

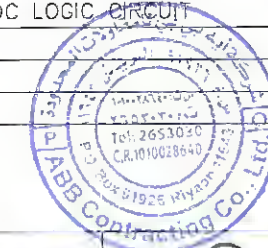
| CONTENTS | SHEET | REV. | REMARKS |
|---|-------|------|-----------------------|
| COVER SHEET | 000 | 07 | COMMON |
| LIST OF CONTENTS | 001 | 07 | COMMON |
| LIST OF CONTENTS | 002 | 07 | COMMON |
| 132kV UG FEEDER 8192A AC CIRCUIT | 003 | 07 | TYPICAL |
| 132kV UG FEEDER 8192A DC LOGIC CIRCUIT | 004 | 07 | TYPICAL |
| 132/13.8kV GT-1 AC CIRCUIT | 005 | 07 | TYPICAL |
| 132/13.8kV GT-1 DC LOGIC CIRCUIT | 006 | 07 | TYPICAL |
| 132kV SIDE OF 502 MVA SGT-1 AC CIRCUIT | 007 | 07 | TYPICAL |
| 132kV SIDE OF 502 MVA SGT-1 DC LOGIC CIRCUIT | 008 | 07 | TYPICAL |
| 132kV SHUNT REACTOR-1 AC CIRCUIT | 009 | 07 | TYPICAL |
| 132kV SHUNT REACTOR-1 DC LOGIC CIRCUIT | 010 | 07 | TYPICAL |
| 132kV BUS COUPLER-1 AC CIRCUIT-130 | 011 | 07 | TYPICAL |
| 132kV BUS COUPLER-1 DC LOGIC CIRCUIT-130 | 012 | 07 | TYPICAL |
| 132kV BUS SECTION-1 AC CIRCUIT-120 | 013 | 07 | TYPICAL |
| 132kV BUS SECTION-1 DC LOGIC CIRCUIT-120 | 014 | 07 | TYPICAL |
| 132kV SPARE D21 150 MVAR CAPACITOR BFR AC CIRCUIT | 015 | 07 | TYPICAL |
| 132kV SPARE D21 150 MVAR CAPACITOR BFR DC LOGIC CIRCUIT | 016 | 07 | TYPICAL |
| 132kV SPARE D19 UGC BFR AC CIRCUIT | 016A | 07 | TYPICAL |
| 132kV SPARE D19 UGC BFR DC LOGIC CIRCUIT | 016B | 07 | TYPICAL |
| 132kV BUS COUPLER-2 AC CIRCUIT-230 | 017 | 07 | TO BE SUBMITTED LATER |
| 132kV BUS COUPLER-2 DC LOGIC CIRCUIT-130 | 018 | 07 | TO BE SUBMITTED LATER |
| 132kV UG FEEDER 8192B AC CIRCUIT | 019 | 07 | TO BE SUBMITTED LATER |

| CONTENTS | SHEET | REV. | REMARKS |
|--|-------|------|-----------------------|
| 132kV UG FEEDER 8192B DC LOGIC CIRCUIT | 020 | 07 | TO BE SUBMITTED LATER |
| 132kV UG FEEDER 8191A AC CIRCUIT | 021 | 07 | TO BE SUBMITTED LATER |
| 132kV UG FEEDER 8191A DC LOGIC CIRCUIT | 022 | 07 | TO BE SUBMITTED LATER |
| 132kV UG FEEDER 8191B AC CIRCUIT | 023 | 07 | TO BE SUBMITTED LATER |
| 132kV UG FEEDER 8191B DC LOGIC CIRCUIT | 024 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV TRANSFORMER GT-2 AC CIRCUIT | 025 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV TRANSFORMER GT-2 DC LOGIC CIRCUIT | 026 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV TRANSFORMER GT-3 AC CIRCUIT | 027 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV TRANSFORMER GT-3 DC LOGIC CIRCUIT | 028 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV SGT-2 AC CIRCUIT | 029 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV SGT-2 DC LOGIC CIRCUIT | 030 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV SGT-3 AC CIRCUIT | 031 | 07 | TO BE SUBMITTED LATER |
| 132/13.8kV SGT-3 DC LOGIC CIRCUIT | 032 | 07 | TO BE SUBMITTED LATER |
| 132kV SHUNT REACTOR-2 AC CIRCUIT | 033 | 07 | TO BE SUBMITTED LATER |
| 132kV SHUNT REACTOR-2 DC LOGIC CIRCUIT | 034 | 07 | TO BE SUBMITTED LATER |
| 132kV SPARE D17 UGC BFR AC CIRCUIT | 035 | 07 | TO BE SUBMITTED LATER |
| 132kV SPARE D17 UGC BFR DC LOGIC CIRCUIT | 036 | 07 | TO BE SUBMITTED LATER |
| 132kV SPARE D15 UGC BFR AC CIRCUIT | 037 | 07 | TO BE SUBMITTED LATER |
| 132kV SPARE D15 UGC BFR DC LOGIC CIRCUIT | 038 | 07 | TO BE SUBMITTED LATER |
| 132kV SPARE D11 UGC BFR AC CIRCUIT | 039 | 07 | TO BE SUBMITTED LATER |
| 132kV SPARE D11 UGC BFR DC LOGIC CIRCUIT | 040 | 07 | TO BE SUBMITTED LATER |

| AS-BUILT BY _____ DATE _____ | | | |
|------------------------------|-------|-----------------------------------|-------------------|
| 07 | 12 21 | RVD AS PER SEC REF LTR * 30502101 | NS NK AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER * 91081 | NS NK AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER * 90994 | NS NK AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. CERT. APPD. |

| | | | |
|--------------|------------|------------|----------|
| DRAWN BY | TSR | CHECKED BY | NSR |
| DATE STARTED | 06/10/2010 | DATE COMP | |
| PRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSNM |

| LIST OF CONTENTS | |
|--------------------------------------|-------------------------|
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NC.11033009/00 |
| RIYADH | SAUDI ARABIA |



الشركة السعودية للكهرباء
Saudi Electricity Company

| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
|---------------|-------|-----------|----------------|----------|
| N/A | P | C292 | CD-176662 | 07 |

| ABB PROJECT NO. | ABB SHT NO. |
|-----------------|-------------|
| S-12926 | 001 |

| CONTENTS | SHEET | REV. | REMARKS |
|--|-------|------|-----------------------|
| 132kV UGF 8191A CLOSING LOGIC | 063 | 07 | TO BE SUBMITTED LATER |
| 132 kV UGF 8191B CLOSING LOGIC | 064 | 07 | TO BE SUBMITTED LATER |
| 132kV BUS COUPLER-1 CLOSING LOGIC | 065 | 07 | TYPICAL |
| 132kV BUS COUPLER-2 CLOSING LOGIC | 066 | 07 | TO BE SUBMITTED LATER |
| 132kV BUS SECTION-1 CLOSING LOGIC | 067 | 07 | TYPICAL |
| 132kV BUS SECTION-2 CLOSING LOGIC | 068 | 07 | TO BE SUBMITTED LATER |
| 132kV SIDE OF SGT-1 CLOSING LOGIC | 069 | 07 | TYPICAL |
| 132kV SIDE OF SGT-2 CLOSING LOGIC | 070 | 07 | TO BE SUBMITTED LATER |
| 132kV SIDE OF SGT-3 CLOSING LOGIC | 071 | 07 | TO BE SUBMITTED LATER |
| SPARE | 072 | 07 | |
| SPARE | 073 | 07 | |
| SPARE | 074 | 07 | |
| SPARE | 075 | 07 | |
| SPARE | 076 | 07 | |
| SPARE | 077 | 07 | |
| SPARE | 078 | 07 | |
| SPARE | 079 | 07 | |
| SPARE | 080 | 07 | |
| 132kV PROTECTION DEVICES NOMENCLATURES | 081 | 07 | COMMON |
| 132kV PROTECTION DEVICES NOMENCLATURES | 082 | 07 | COMMON |
| 132kV PROTECTION DEVICES NOMENCLATURES | 083 | 07 | COMMON |
| SCHEDULE OF MAIN PROTECTIVE RELAYS | 084 | 07 | COMMON |
| SPARE | 085 | 07 | |

Saudi Electricity Company
CTJ. Projects Department

☐ Approved
☒ Approved with comments
☐ Disapproved

SIGN: TSR
SYED ZAFRULLA MALGIMANI
NAME: 31-07-2012
12 / 91226 / 12021001
DATE: 23-07-2012

SAE & Date:




| | |
|-----------------|---------------------|
| ABB PROJECT NO. | ABB SHT NO. |
| S-12926 | SHEET 002 CONT. 003 |

| | |
|--|-------------------|
| AS-BUILT BY: _____ DATE: _____ | AK |
| 07 12 21 RVD AS PER SEC REF LTR # 30502101 NS NK | AK |
| 06 12 21 RVD AS PER SEC REF LETTER # 91081 NS NK | AK |
| 05 12 16 RVD AS PER SEC REF LETTER # 90994 NS NK | AK |
| REV. NO. DATE DESCRIPTION | CHKD. CERT. APPD. |

| |
|--------------------------------------|
| LIST OF CONTENTS |
| PROTECTION LOGIC SINGLE LINE DIAGRAM |
| S/S 9020 CONTRACT NO. 11033009/00 |
| RIYADH SAUDI ARABIA |

| | |
|---|--------------------------|
| الشركة السعودية للكهرباء Saudi Electricity Company | SHEET NO. 05 of 54 |
| JOB ORDER NO. N/A | INDEX P |
| PLANT NO. C292 | DRAWING NUMBER CD-176662 |
| REV. NO. 07 | |



Saudi Electricity Company
CTA Projects Department

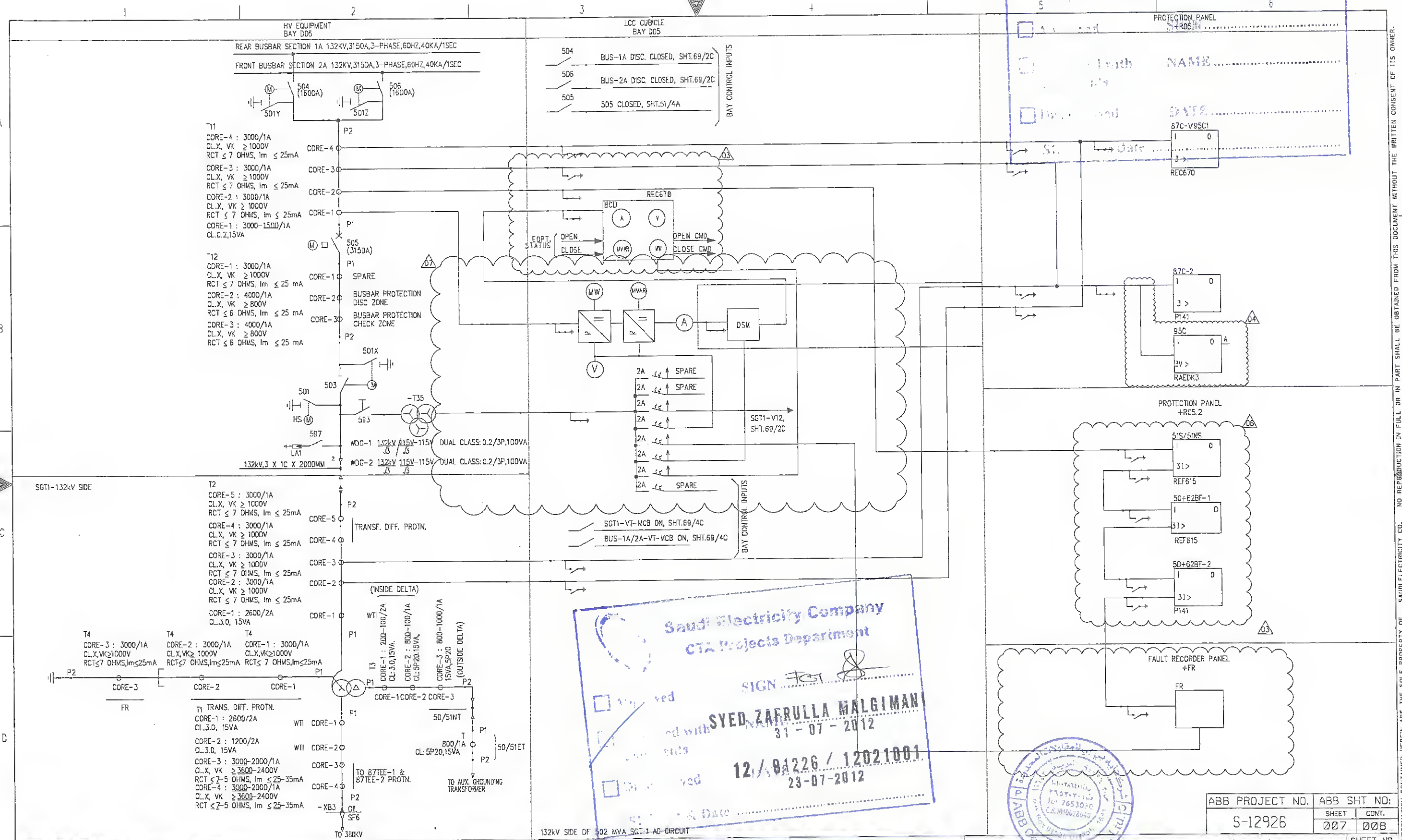
PROTECTION PANEL
+R05.1

NAME

DATE

87C-V95C1

REC670



| AS-BUILT BY _____ DATE _____ | | | | | |
|------------------------------|-------|-----------------------------------|-------|-------|-------|
| Ø7 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| Ø6 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| Ø5 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |

Saudi Electricity Company
CTA Projects Department

SIGN *[Signature]*

12/01226 / 12021001

23-07-2012

132kV SIDE OF 502 MVA SGT-1 AC CIRCUIT

PROTECTION LOGIC SINGLE LINE DIAGRAM

S/S 9020 CONTRACT NO.11033009/00

RIYADH SAUDI ARABIA

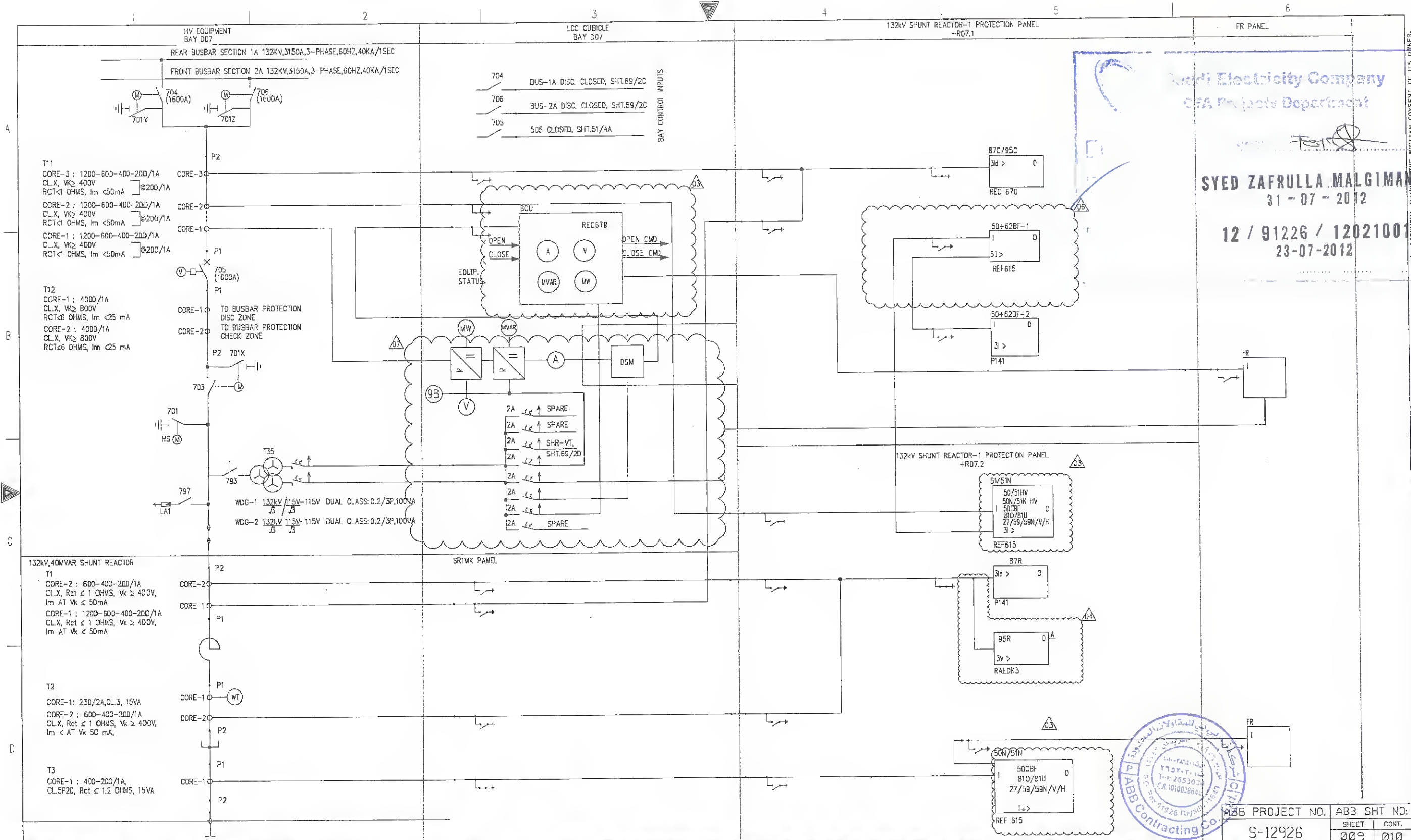
| | | | | |
|--|-------|-----------|----------------|--------------------------|
|  <div>الشركة السعودية للكهرباء Saudia Electricity Company</div> | | | | SHEET NO. 10 of 54 |
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | P | C292 | CD-176662 | 07 |

5

SEC-D (2004/10)

This Drawing and the I

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



Saudi Electricity Company
O&A Projects Department

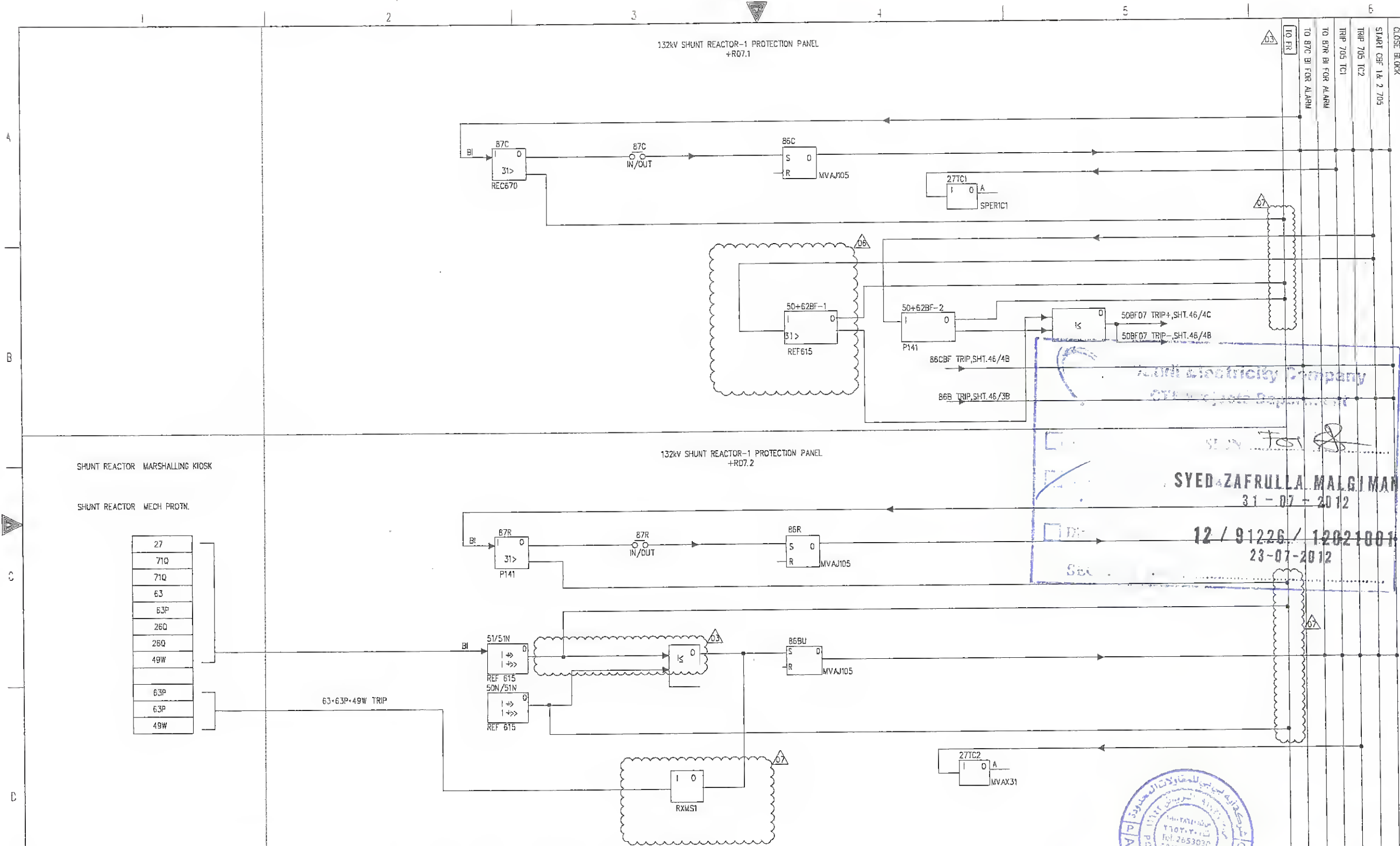
SYED ZAFRULLA MALGIMANI
31-07-2012
12 / 91226 / 12021001
23-07-2012

| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

132kV SHUNT REACTOR PROTN. PANEL AC CIRCUIT
PROTECTION LOGIC SINGLE LINE DIAGRAM
S/S 9020 CONTRACT NO.11033009/00
RIYADH SAUDI ARABIA

| | | | | | | | |
|--------------------------------|--|---|--|---|--|---|--|
| AS-BUILT BY _____ DATE _____ | | DRAWN BY <u>TSR</u> CHECKED BY <u>NSR</u> | | DATE STARTED <u>06/10/2010</u> DATE COMP. _____ | | PRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSNM</u> | |
| ABB PROJECT NO. <u>S-12926</u> | | ABB SHT NO. <u>009</u> | | SHEET NO. <u>12</u> | | REV. NO. <u>07</u> | |
| JOB ORDER NO. <u>N/A</u> | | INDEX <u>P</u> | | PLANT NO. <u>C292</u> | | DRAWING NUMBER <u>CD-176662</u> | |

الشركة السعودية للكهرباء
Saudi Electricity Company



SYED ZAFRULLA MALGIMANI
 31-07-2012
 12 / 91226 / 12021001
 23-07-2012

| | |
|-----------------|---------------------|
| ABB PROJECT NO. | ABB SHT NO. |
| S-12926 | SHEET 010 CONT. 011 |

| | | | | | |
|----------|-------|-----------------------------------|-------|-------|-------|
| AS-BUILT | BY | DATE | | | |
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90934 | NS | NK | AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |

| | |
|--------------------------------------|-------------------------|
| 132kV SHUNT REACTOR -1 DC LOGIC CKT. | |
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| | | |
|---|----------|--------------------|
| الشركة السعودية للكهرباء Saudi Electricity Company | | SHEET NO. 13 of 54 |
| JOB ORDER NO. | INDEX | PLANT NO. |
| N/A | P | C292 |
| DRAWING NUMBER | REV. NO. | |
| CD-176662 | 07 | |


THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

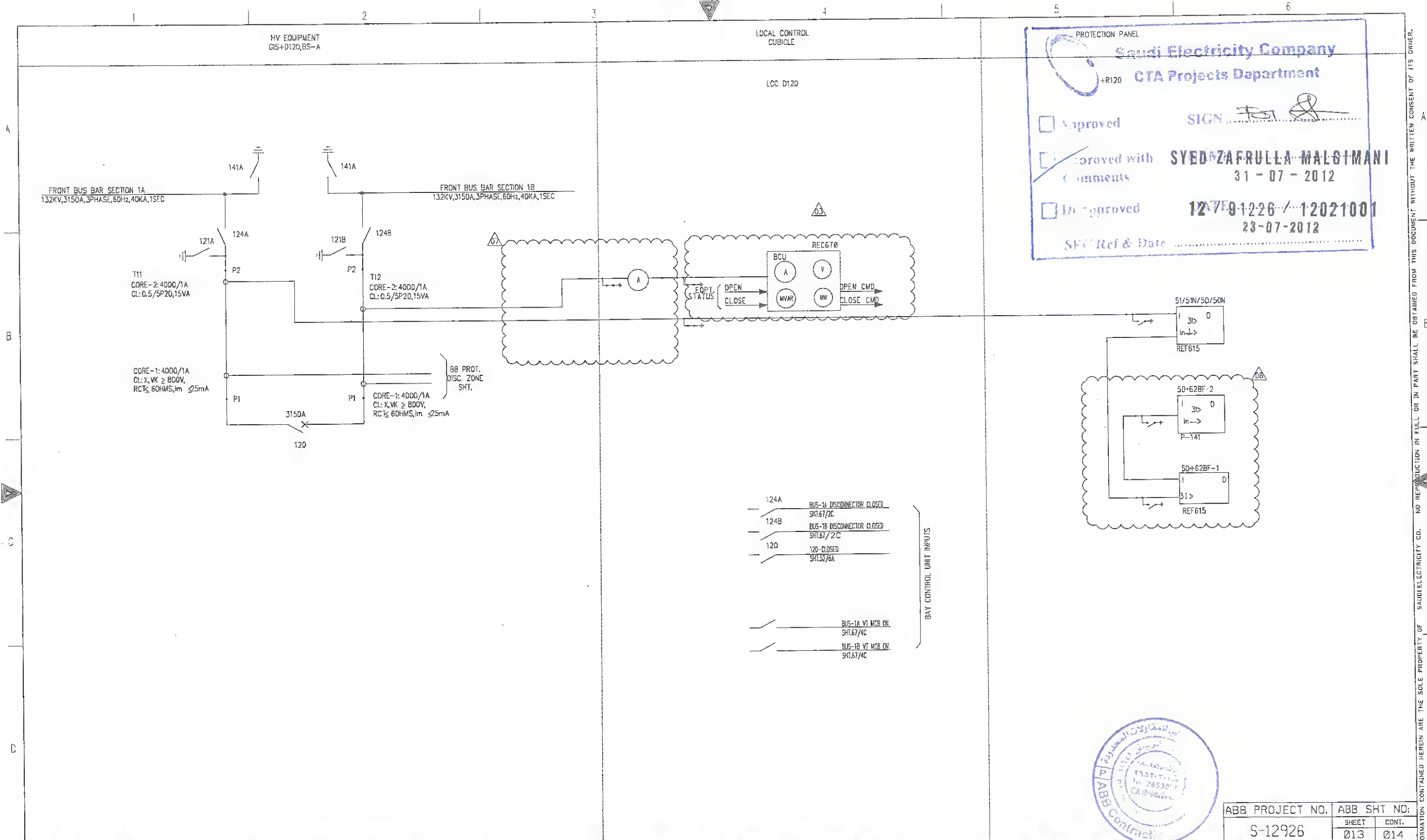
SYED ZAFRULLA MALGIMA
31-07-2012

12-191226-1202100
23-07-2012



| | |
|--------------------------------------|-------------------------|
| 132kV BUS COUPLER -1 AC CIRCUIT -130 | |
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| | | | | |
|---|-------|-----------|----------------|--------------------------|
|  الشركة السعودية للكهرباء Saudi Electricity Company | | | | SHEET NO. 14 of 54 |
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | P | C292 | CD-176662 | Ø7 |



PROTECTION PANEL

Saudi Electricity Company
CTA Projects Department

+R120

☐ Approved SIGN *[Signature]*

☒ Approved with Comments **SYED ZAFRULLA MALGIMANI**
31-07-2012

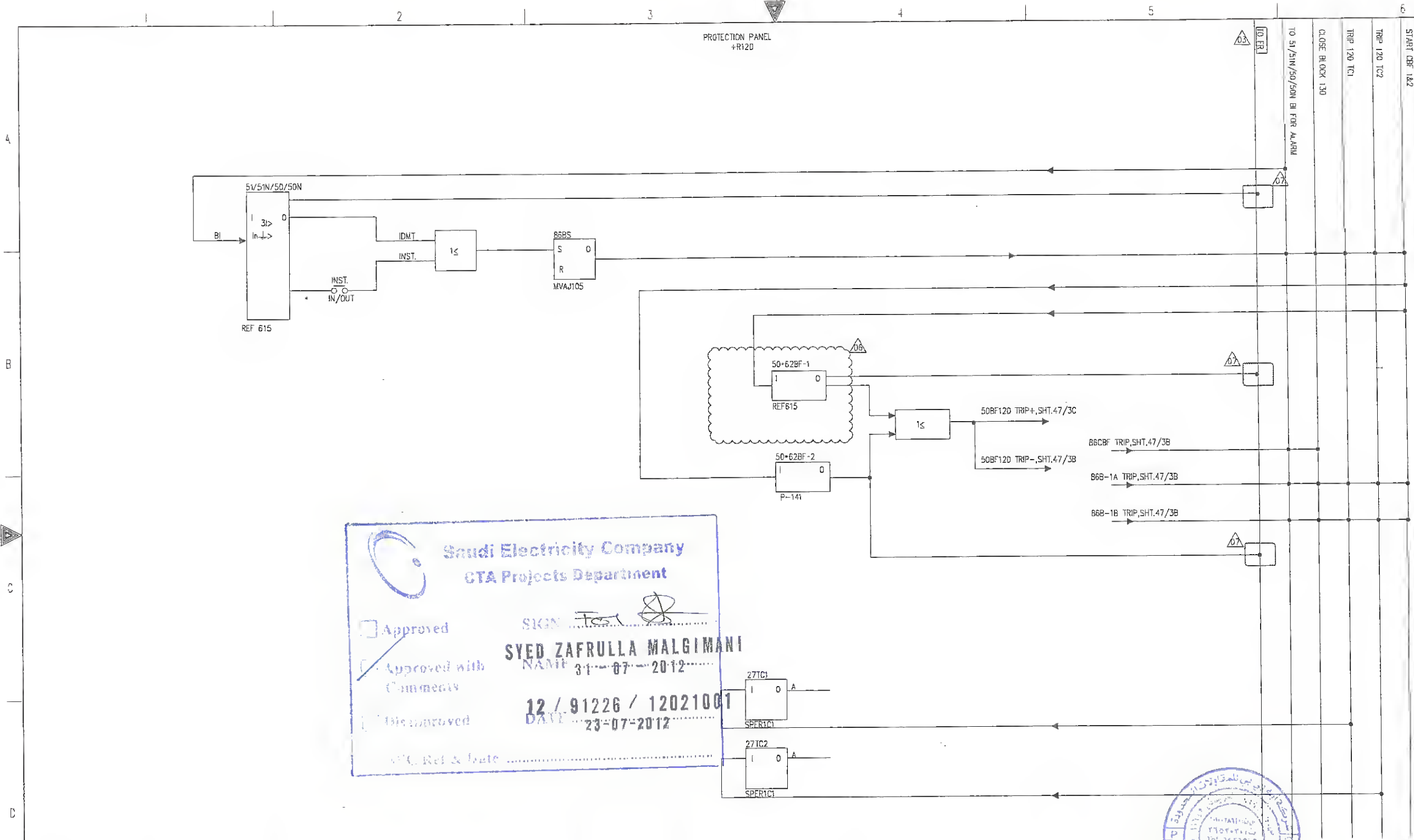
☐ In Approved **12-07-2012** **91226/12021001**
23-07-2012

SEC Ref & Date



| | | | | | | | | | | | | | | | |
|------------------------------|-------|-----------------------------------|-------|-------|-------|--------------------------------------|--|--|--|---|--|--|--|--------------------|--|
| AS-BUILT BY _____ DATE _____ | | | | | | 132kV BUS SECTION - 1 AC CIRCUIT | | | | الشركة السعودية للكهرباء | | | | SHEET NO. 16 of 54 | |
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | | Saudi Electricity Company | | | | | |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91091 | NS | NK | AK | S/S 9020 CONTRACT NO.11033009/00 | | | | JOB ORDER NO. N/A INDEX P PLANT NO. C292 DRAWING NUMBER CD-176662 | | | | REV. NO. 07 | |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | RIYADH SAUDI ARABIA | | | | | | | | | |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. | | | | | | | | | | |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



Saudi Electricity Company
ETA Projects Department

Approved _____
 Approved with Comments _____
 Disapproved _____

SIGN *Fest*
SYED ZAFRULLA MALGIMANI
 NAME 31-07-2012
 DATE 12 / 91226 / 12021001
 DATE 23-07-2012

C/C Ref & Date _____



| AS-BUILT BY _____ DATE _____ | | | |
|------------------------------|-------|-----------------------------------|-------------------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS NK AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS NK AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS NK AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. CERT. APPD. |

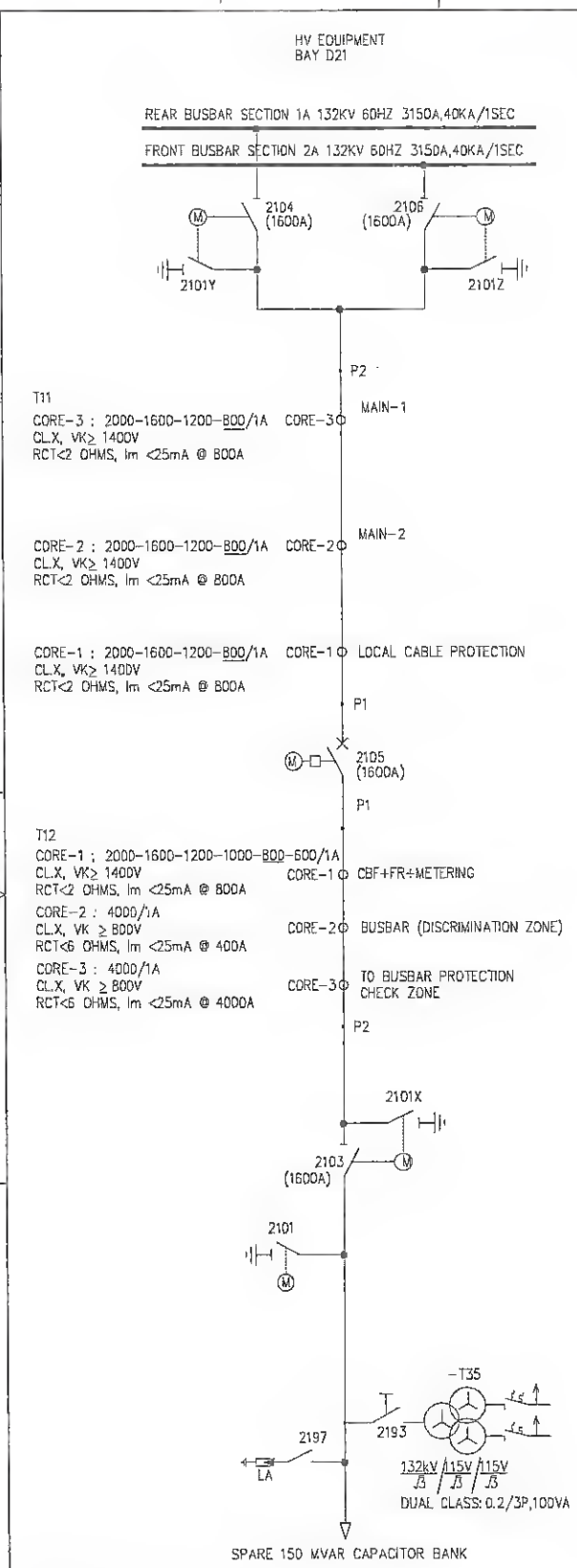
| 132kV BUS SECTION - 1 DC LOGIC CIRCUIT | |
|--|-------------------------|
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| الشركة السعودية للكهرباء Saudi Electricity Company | | | | SHEET NO. 17 of 54 | |
|---|-------|-----------|----------------|--------------------|--|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. | |
| N/A | P | C292 | CD-176662 | 07 | |

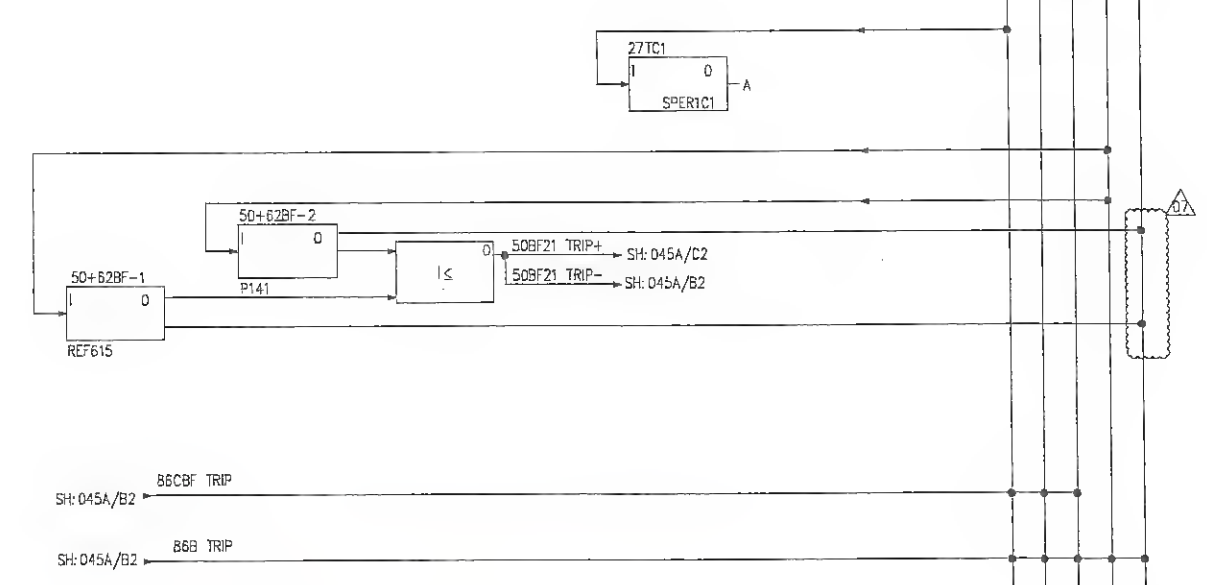
| ABB PROJECT NO. | ABB SHT NO. |
|-----------------|-------------|
| S-12926 | 014 015 |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



132KV SPARE BREAKER FAILURE PANEL-1
+RBF01



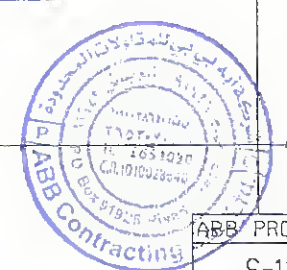
Saudi Electricity Company
C&E Projects Department

Approved

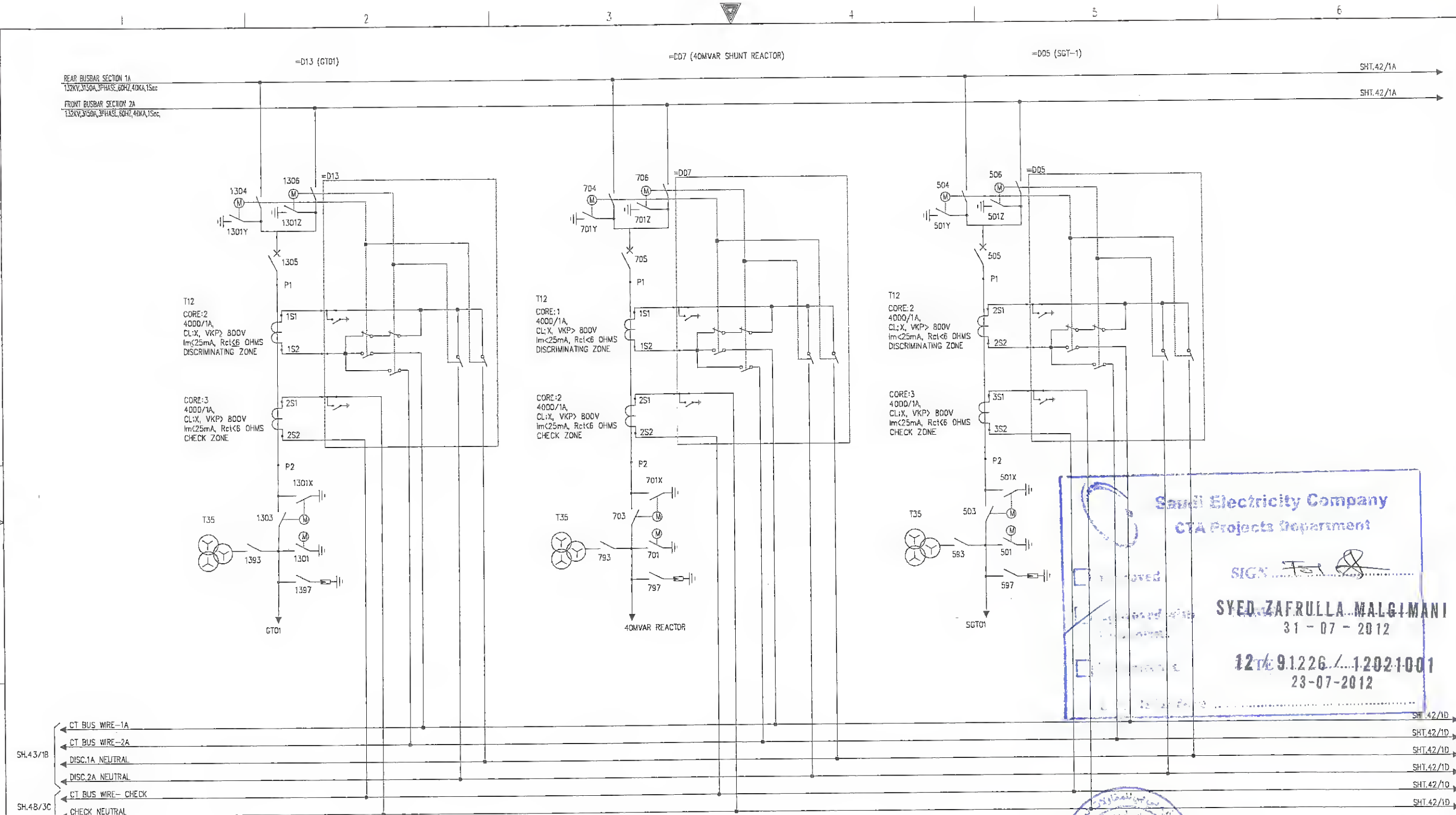
SYED ZAFRULLA MALGIMANI
31-07-2012

12/91226/12021001
23-07-2012

Ref & Date



| | | | | | | | | | | | | | | |
|------------------------------|-------|-----------------------------------|---|-------|-------|---|--|--|-------------------------|--|-------------------------|--|-------------------|--|
| AS-BUILT BY _____ DATE _____ | | | 132KV SPARE D21 150 MVAR CAPACITOR BFR DC LOGIC CIRCUIT | | | الشركة السعودية للكهرباء | | | ABB PROJECT NO. S-12926 | | ABB SHT NO. 016 | | SHEET 19 of 54 | |
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | S/5 9020 | | CONTRACT NO.11033009/00 | | JOB ORDER NO. N/A | |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | DATE STARTED 06/10/2010 DATE COMP _____ | | | RIYADH | | SAUDI ARABIA | | INDEX P | |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | DATE STARTED 06/10/2010 DATE COMP _____ | | | C292 | | CD-176662 | | PLANT NO. | |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. | ORG. DEPT. CTPD ENG. DEPT. AUT-PSNM | | | 07 | | DRAWING NUMBER | | REV. NO. | |



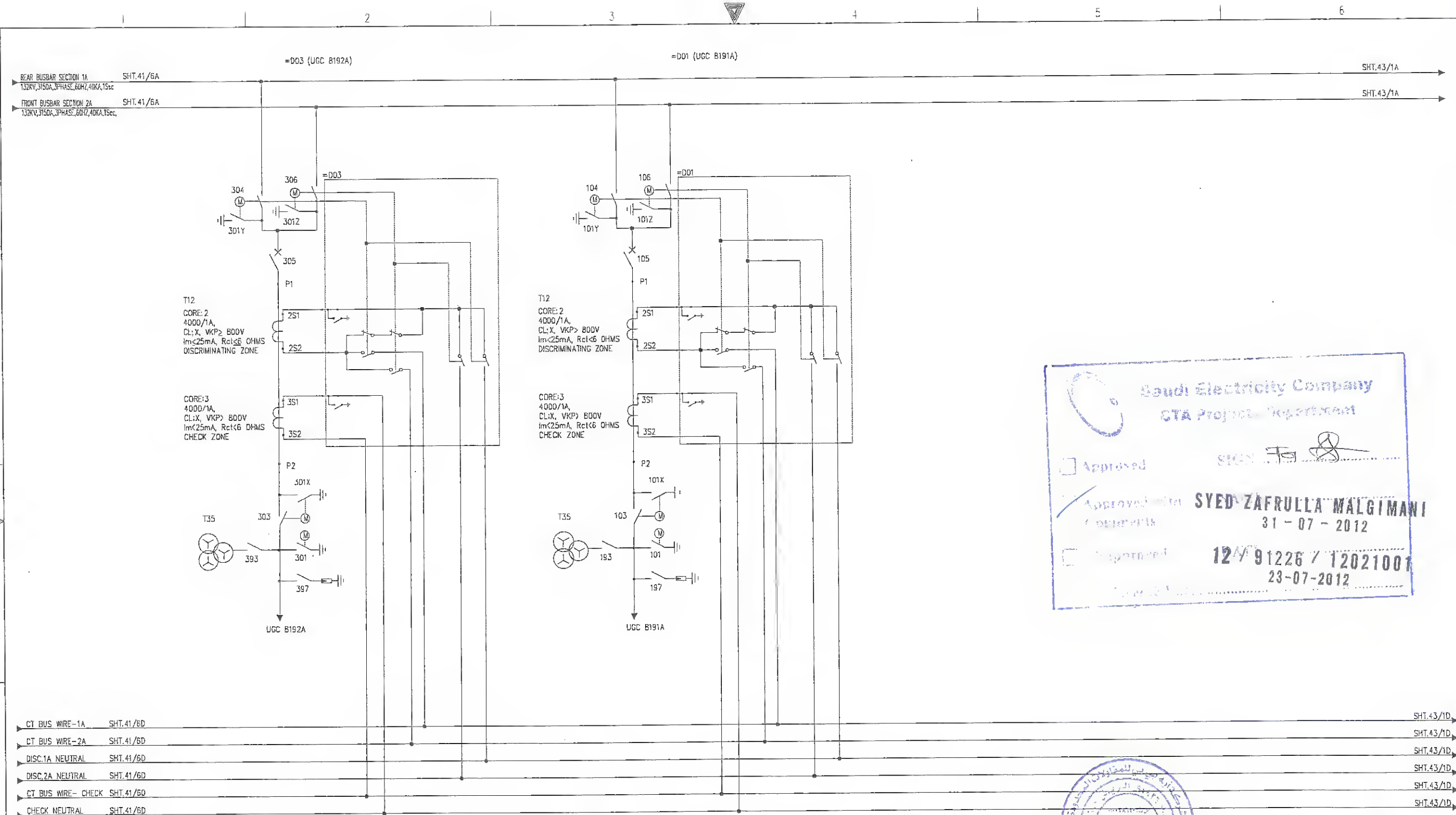
Saudi Electricity Company
CTA Projects Department

SIGN:

SYED ZAFULLA MALGANI
31-07-2012

12/9.1226/12021001
23-07-2012

| | | | | | | | | | | | | | | | | | | |
|------------------------------|------|-------------|-----------------------------------|----|-------|-------|--|-------------------------|--------------------------------------|--|--|--|---------------|--|--------------------|-----------|----------------|----------|
| AS-BUILT BY _____ DATE _____ | | | | | | | BUS BAR PROTECTION AC CIRCUIT | | | | <div>Contract</div> <div>الشركة السعودية للكهرباء</div> <div>Saudi Electricity Company</div> | | | | SHEET NO. 22 of 54 | | | |
| Ø7 | 12 | 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | DRAWN BY <u>TSR</u> CHECKED BY <u>NSR</u> | | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | | JOB ORDER NO. | | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| Ø6 | 12 | 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | DATE STARTED <u>06/10/2010</u> DATE COMP _____ | | S/S 9020 CONTRACT NO.11033009/00 | | | | N/A | | P | C292 | CD-176662 | Ø7 |
| Ø5 | 12 | 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | DATE STARTED _____ DATE COMP _____ | | RIYADH SAUDI ARABIA | | | | | | | | | |
| REV. NO. | DATE | DESCRIPTION | | | CHKD. | CERT. | APPD. | OPRG. DEPT. <u>CTPD</u> | ENG. DEPT. <u>AUT-PSNM</u> | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |



Saudi Electricity Company
CTA Project Department

Approved: **SYED ZAFULLA MALSIMANI**
31-07-2012

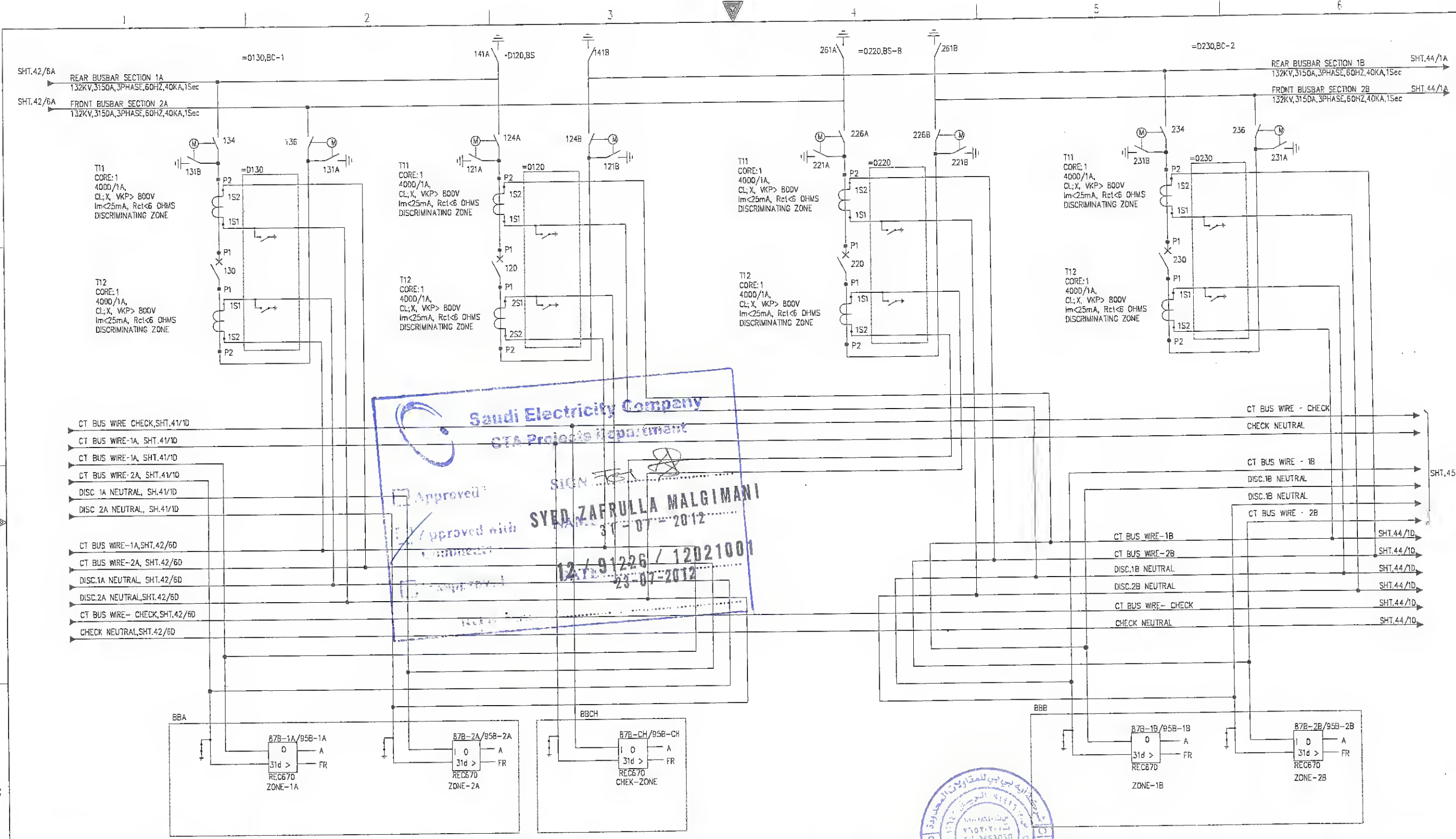
Approved: **12/91226/12021001**
23-07-2012

| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

| | |
|--|---|
| AS-BUILT BY _____ DATE _____ | BUS BAR PROTECTION AC CIRCUIT |
| DRAWN BY <u>TSR</u> CHECKED BY <u>NSR</u> | PROTECTION LOGIC SINGLE LINE DIAGRAM |
| DATE STARTED <u>06/10/2010</u> DATE COMP _____ | S/S <u>9020</u> CONTRACT NO. <u>11033009/00</u> |
| ORIG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSNM</u> | RIYADH SAUDI ARABIA |

| | | | | |
|--------------------------------|----------------|------------------------|---------------------------------|----------------------------------|
| ABB PROJECT NO. <u>S-12926</u> | | ABB SHT NO: <u>042</u> | | SHEET NO. <u>23</u> of <u>54</u> |
| JOB ORDER NO. <u>N/A</u> | INDEX <u>P</u> | PLANT NO. <u>C292</u> | DRAWING NUMBER <u>CD-176662</u> | REV. NO. <u>07</u> |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

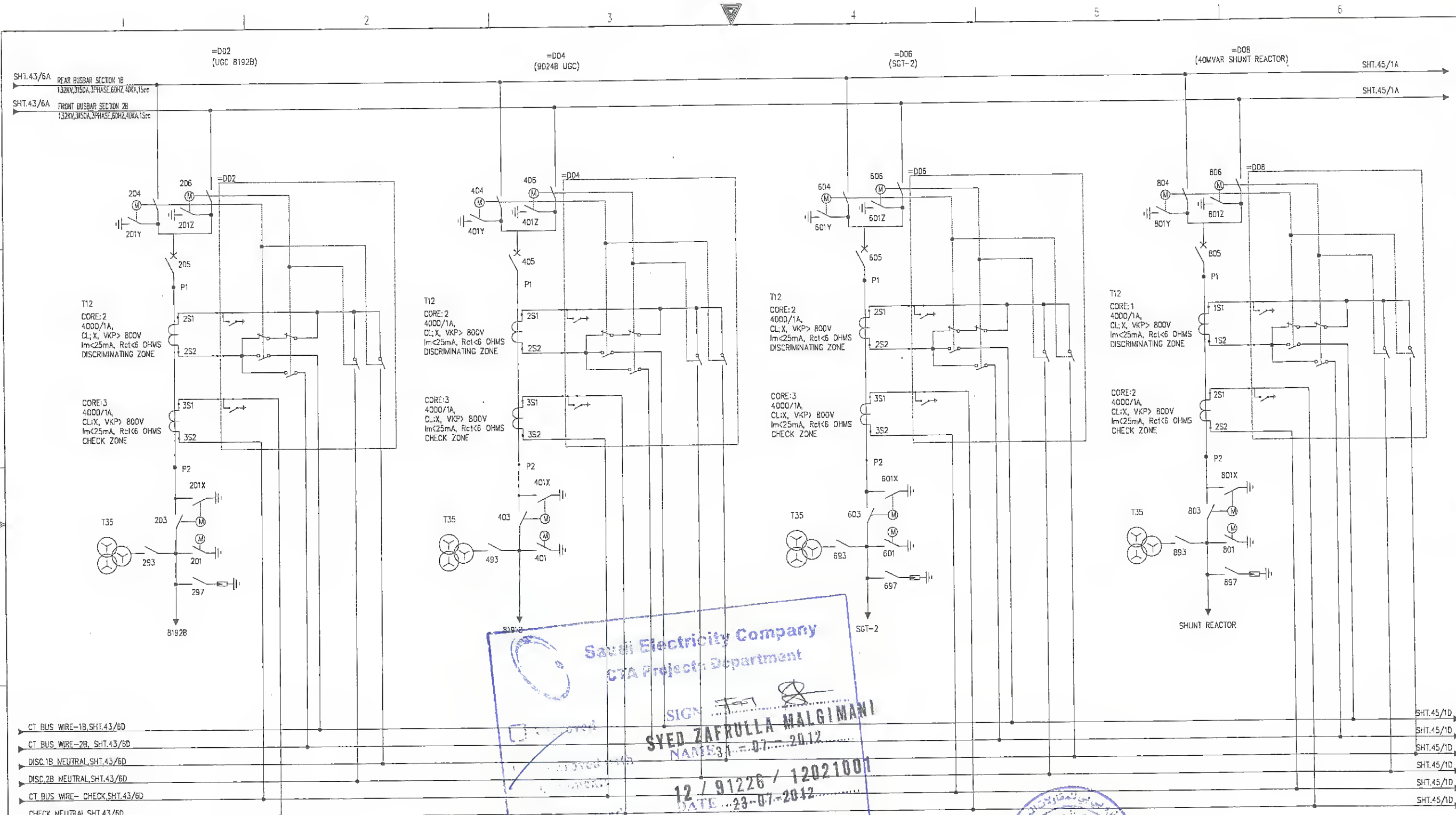


| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

| | |
|--|---|
| AS-BUILT BY _____ DATE _____ DRAWN BY TSR CHECKED BY NSR DATE STARTED 06/10/2010 DATE COMP _____ OPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM | BUS BAR PROTECTION AC CIRCUIT PROTECTION LOGIC SINGLE LINE DIAGRAM S/S 9020 RIYADH |
|--|---|

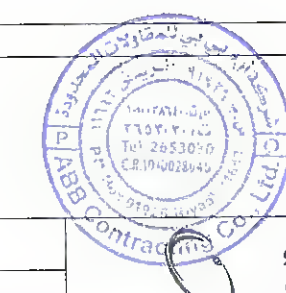
| | |
|---|---|
| الشركة السعودية للكهرباء Saudi Electricity Company | JOB ORDER NO. N/A INDEX P PLANT NO. C292 DRAWING NUMBER CD-176662 REV. NO. 07 |
|---|---|

| | |
|-------------------------|-----------------|
| ABB PROJECT NO. S-12926 | ABB SHT NO. 043 |
| SHEET 043 | CONT. 044 |



Saudi Electricity Company
CTA Projects Department

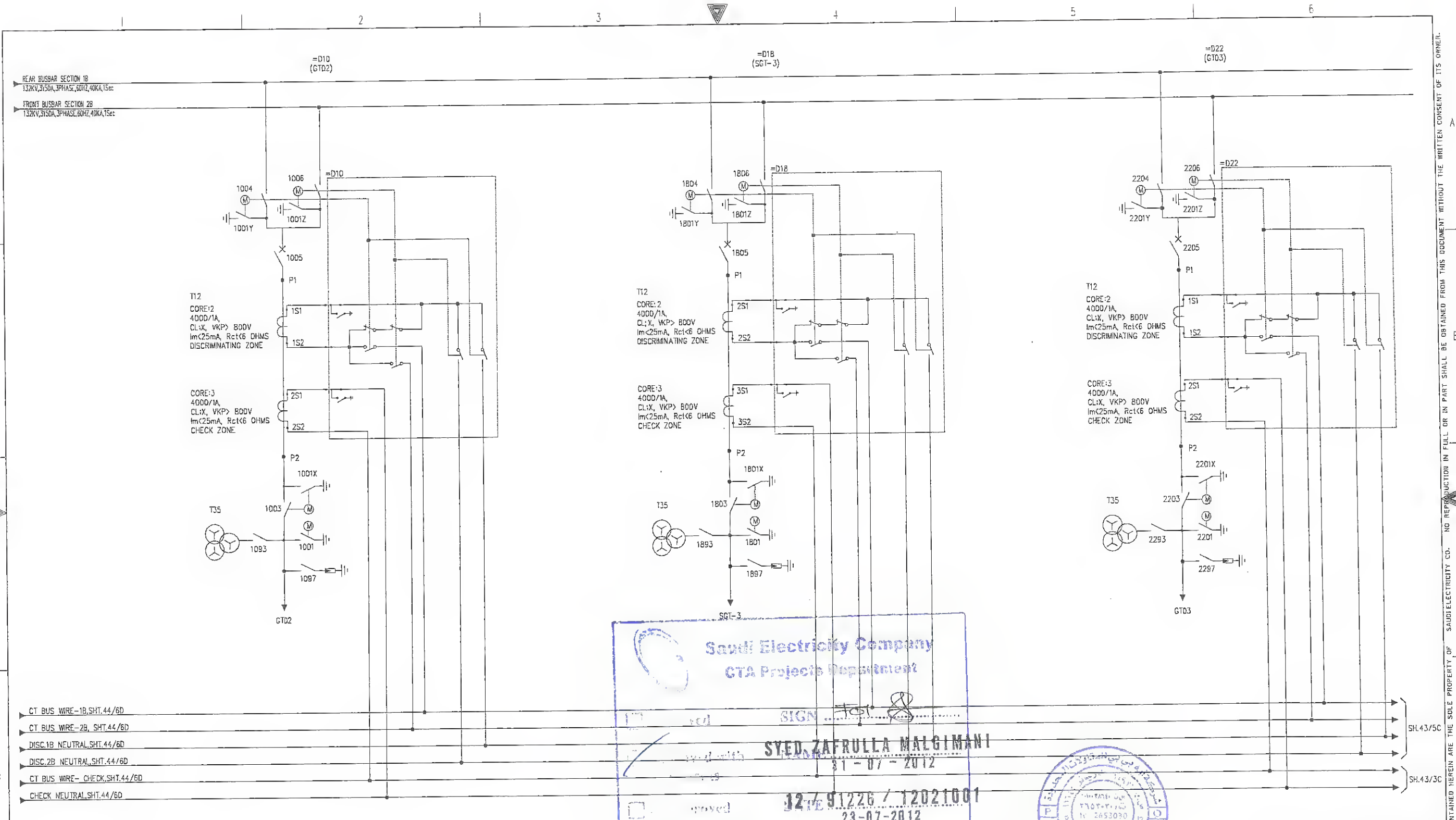
SIGN: *[Signature]*
SYED ZAFRULLA MALGIMANI
NAME 31-07-2012
12 / 91226 / 12021001
DATE 23-07-2012



| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

| | |
|--------------------------------------|-------------------------|
| BUS BAR PROTECTION AC CIRCUIT | |
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| | | | |
|-------------------------|---------|-----------------|--------------------------|
| ABB PROJECT NO. 5-12926 | | ABB SHT NO: 044 | |
| SHEET 044 | | CONT. 045 | |
| SHEET NO. 25 | | of 54 | |
| JOB ORDER NO. N/A | INDEX P | PLANT NO. C292 | DRAWING NUMBER CD-176662 |
| REV. NO. 07 | | | |




Saudi Electricity Company
CTA Projects Department

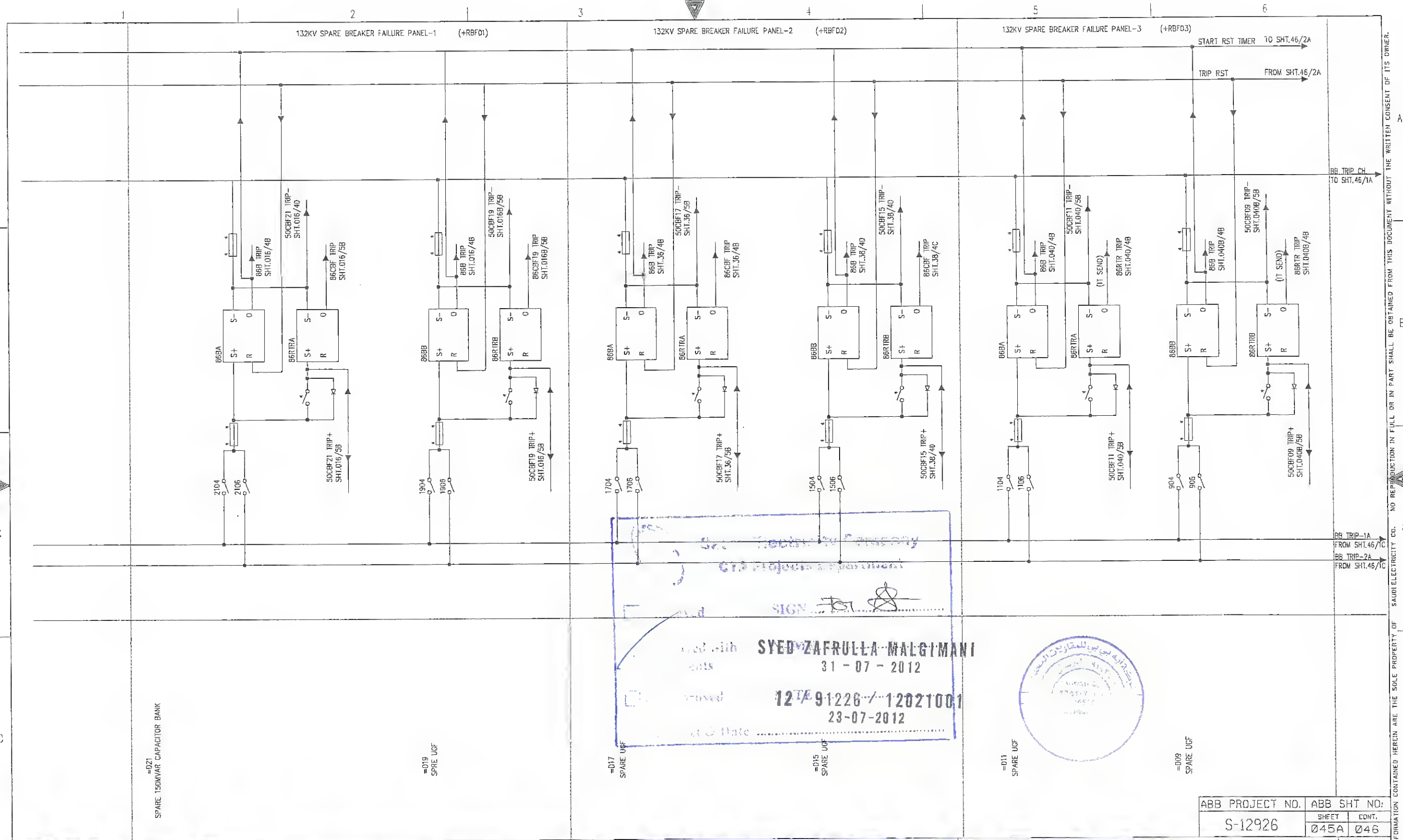
SIGN: **SYED ZAFRULLA MALGIMANI**
 31-07-2012

12/91226 / 12021001
 23-07-2012



| ABB PROJECT NO. | ABB SHT NO. |
|-----------------|-------------|
| S-12926 | 045 045A |

| | | | | | | | | | | | | | | |
|------------------------------|-------|-----------------------------------|----|-------|-------|---|-----------------|---|--|---------------|-------|--------------------------------------|----------------|----------|
| AS-BUILT BY _____ DATE _____ | | | | | | BUS BAR PROTECTION AC CIRCUIT | | <div><div>الشركة السعودية للكهرباء Saudi Electricity Company</div></div> | | | | SHEET NO. 26 of 54 | | |
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | DRAWN BY _____ TSR _____ CHECKED BY _____ NSR _____ | | | | | | PROTECTION LOGIC SINGLE LINE DIAGRAM | | REV. NO. |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | DATE STARTED 06/10/2010 DATE COMP _____ | | S/S 9020 CONTRACT NO.11033009/00 | | JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | OPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM | | RIYADH SAUDI ARABIA | | N/A | P | C292 | CD-176662 | 07 |
| REV. NO. | DATE | DESCRIPTION | | CHKD. | CERT. | APPD. | SEC-D (2004/10) | | | | | | | |



| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

AS-BUILT BY _____ DATE _____
 DRAWN BY TSR CHECKED BY NSR
 DATE STARTED 06/10/2010 DATE COMP _____
 DPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM

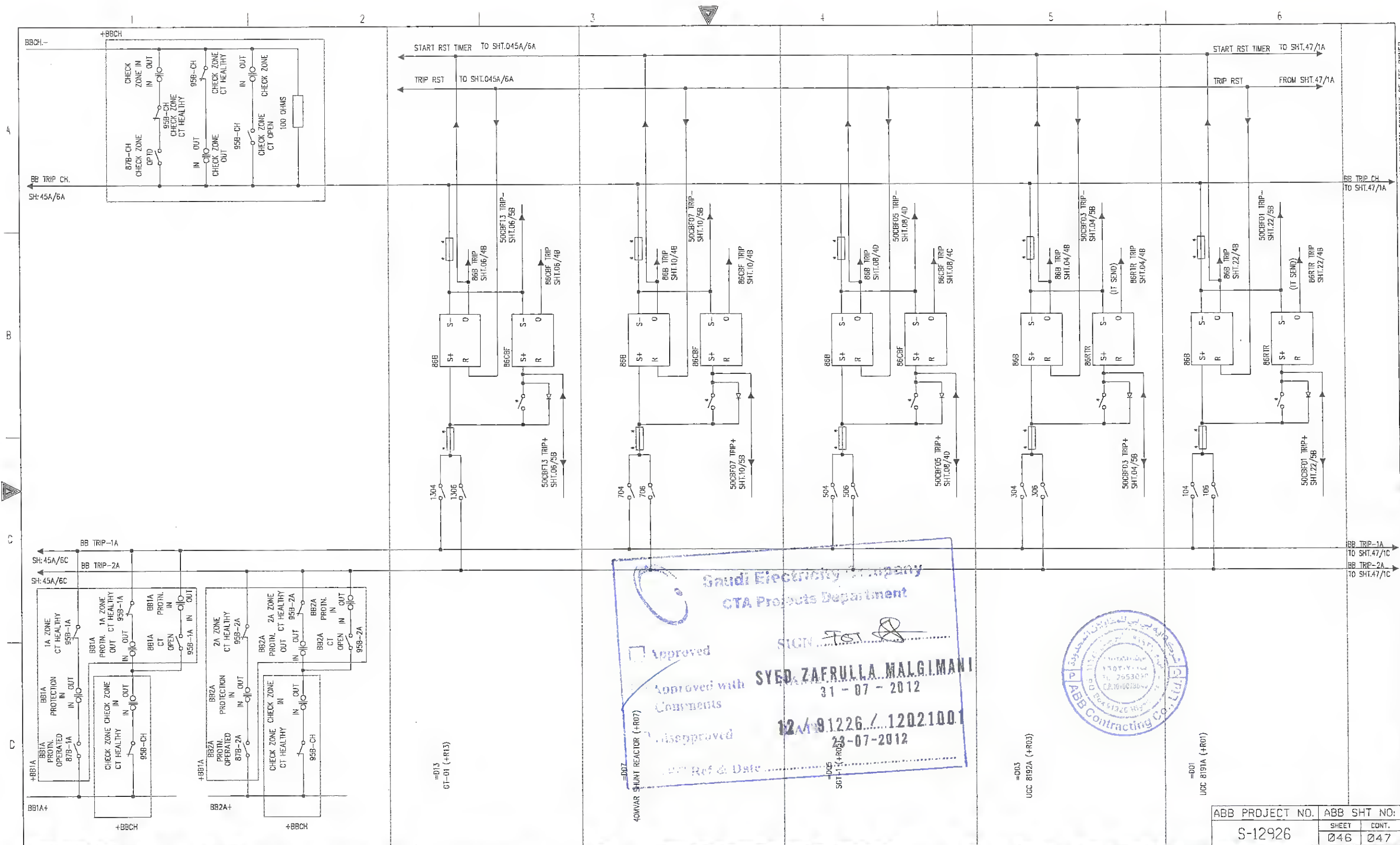
BUS BAR PROTECTION DC CIRCUIT
 PROTECTION LOGIC SINGLE LINE DIAGRAM
 S/S 9020 CONTRACT NO. 11033009/00
 RIYADH SAUDI ARABIA

| | | | | |
|---|--|---|--|--------------------|
| JOB ORDER NO. <u>N/A</u> INDEX <u>P</u> | | PLANT NO. <u>C292</u> DRAWING NUMBER <u>CD-176662</u> | | REV. NO. <u>07</u> |
| SHEET NO. <u>27</u> of <u>54</u> | | SEC-D (2004/10) SEC000 | | |

| | |
|-----------------|-------------|
| ABB PROJECT NO. | ABB SHT NO. |
| S-12926 | 045A 046 |



Signed by **SYED ZAFRULLA MALGIMANI**
 31-07-2012
 12/09/2012 12021001
 23-07-2012



Gaudi Electricity Company
 CTA Projects Department
 Approved with Comments
SYED ZAFRULLA MALGIMANI
 31-07-2012
 12/09/2012 / 12021001
 23-07-2012
 Ref & Date

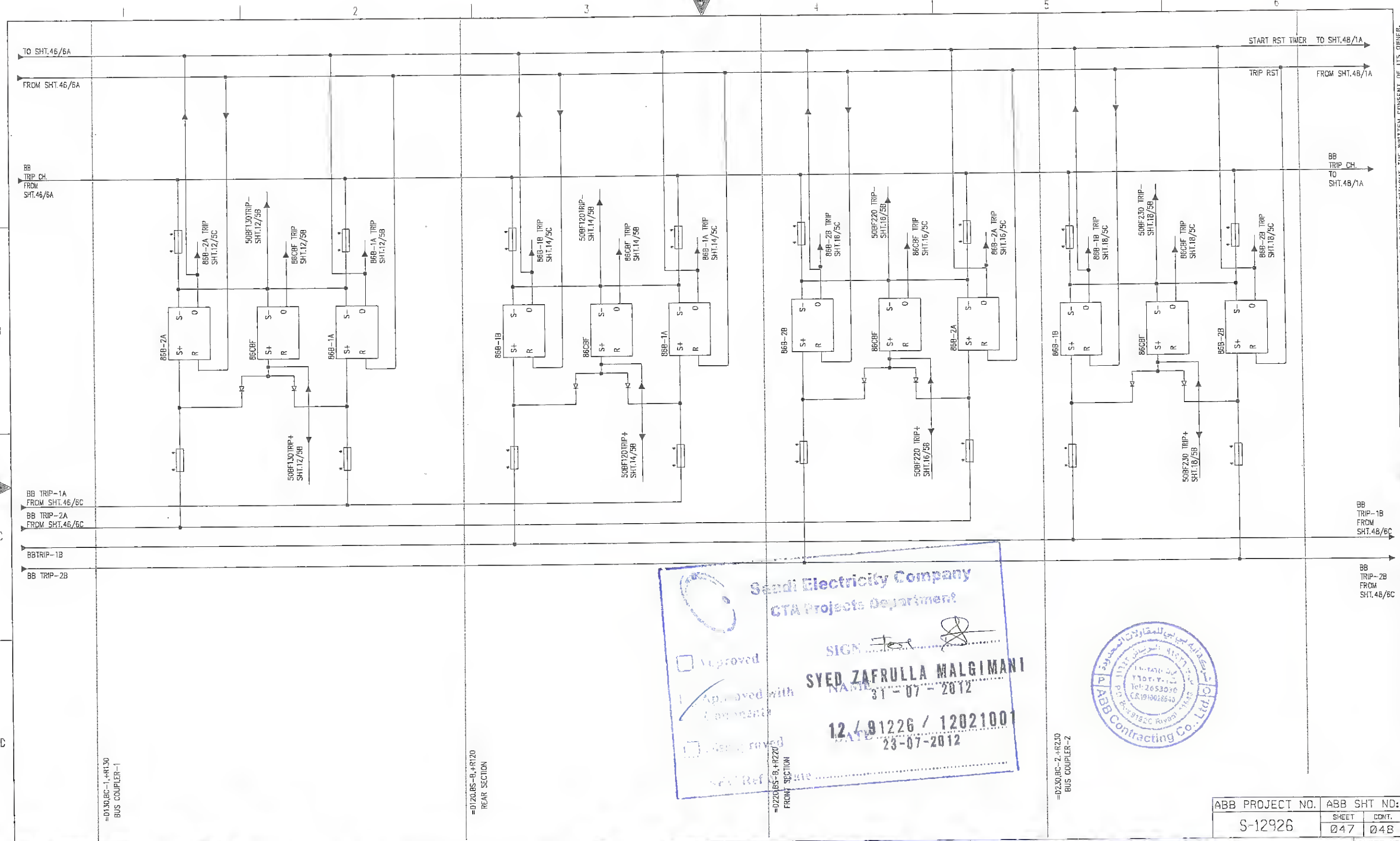


| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12-21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12-21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12-16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

AS-BUILT BY _____ DATE _____
 DRAWN BY ISR CHECKED BY NSR
 DATE STARTED 06/10/2010 DATE COMP _____
 OPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM

BUS BAR PROTECTION DC CIRCUIT
PROTECTION LOGIC SINGLE LINE DIAGRAM
 S/S 9020 CONTRACT NO. 11033009/00
 RIYADH SAUDI ARABIA

| | | | | | |
|---|-------------------|-----------------------------------|------------------------------------|---|-----------------------|
| الشركة السعودية للكهرباء Saudi Electricity Company | | ABB PROJECT NO. S-12926 | | ABB SHT NO. SHEET 046 CONT. 047 | |
| JOB ORDER NO. N/A | INDEX P | PLANT NO. C292 | DRAWING NUMBER CD-176662 | SHEET NO. 28 of 54 | REV. NO. 07 |



Saudi Electricity Company
CTA Projects Department

SIGN *[Signature]*
SYED ZAFRULLA MALGIMANI
31-07-2012
12/91226 / 1202100
23-07-2012

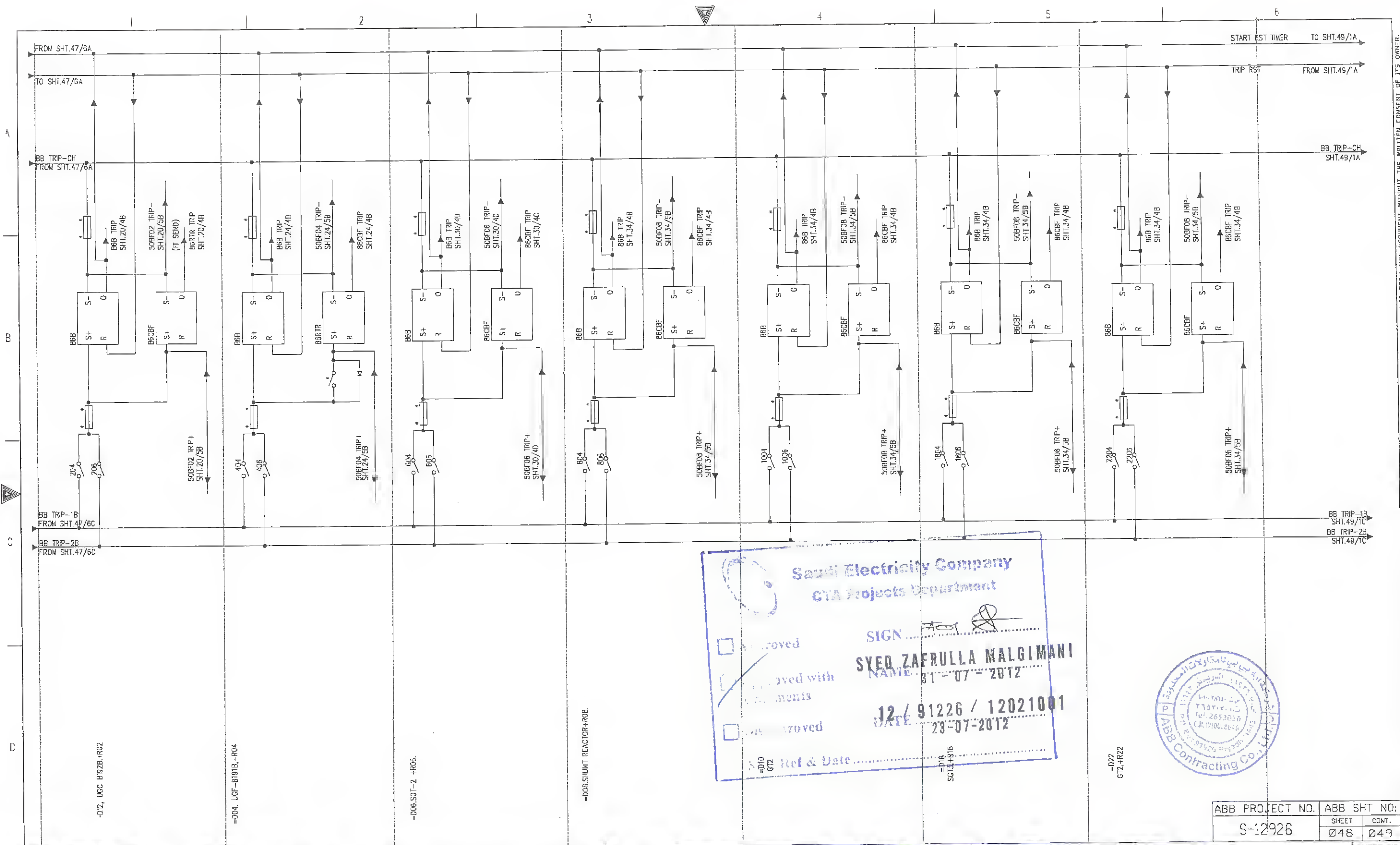
Approved
Approved with
Approved


Ref: *[Reference]*



| AS-BUILT BY _____ DATE _____ | | | | BUS BAR PROTECTION DC CIRCUIT | | | | الشركة السعودية للكهرباء | | | | SHEET NO. | |
|------------------------------|-------|-----------------------------------|-------------------|--------------------------------------|--|--|--|---------------------------|--|--|--|-----------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS NK AK | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | | Saudi Electricity Company | | | | 29 | of 54 |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91001 | NS NK AK | S/S 9020 | | | | SHEET NO. | | | | 047 | 048 |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS NK AK | CONTRACT NO.11033009/00 | | | | SHEET NO. | | | | 047 | 048 |
| REV. NO. | DATE | DESCRIPTION | CHKD, CERT, APPD. | SAUDI ARABIA | | | | SHEET NO. | | | | 047 | 048 |
| | | | | SAUDI ARABIA | | | | SHEET NO. | | | | 047 | 048 |

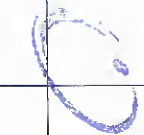
| ABB PROJECT NO. | | ABB SHT NO. | |
|-----------------|--|----------------|--|
| S-12926 | | 047 048 | |
| JOB ORDER NO. | | INDEX | |
| N/A | | P | |
| PLANT NO. | | DRAWING NUMBER | |
| C292 | | CD-176662 | |
| REV. NO. | | REV. NO. | |
| 07 | | 07 | |



| | | | | | | | | | | | | | | | | | | |
|---|-------|-----------------------------------|-------|-------|-------|--|--|--|--|--|--|---|--|--------------------|-------|-----------|----------------|----------|
| AS-BUILT BY _____ DATE _____ | | | | | | BUS BAR PROTECTION DC CIRCUIT | | | | | |  <div>الشركة السعودية للكهرباء Saudi Electricity Company</div> | | SHEET NO. 30 of 54 | | | | |
| DRAWN BY <u>ISR</u> CHECKED BY <u>NSR</u> | | | | | | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | | | | | | REV. NO. | | | | |
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | DATE STARTED <u>06/10/2010</u> DATE COMP _____ | | | | | | S/S <u>9020</u> CONTRACT <u>NC.11033009/00</u> | | JCB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | DATE STARTED <u>06/10/2010</u> DATE COMP _____ | | | | | | S/S <u>9020</u> CONTRACT <u>NC.11033009/00</u> | | N/A | P | C292 | CD-176662 | 07 |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | DPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSNM</u> | | | | | | RIYADH SAUDI ARABIA | | SEC-D (2004/1) | | | | |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. | | | | | | | | | | | | | |

PHILOSOPHY OF 132KV DOUBLF BUS- BAR PROTECTION UNDER DIFFERENT OPERATING CONDITIONS VIS-A-VIS TRIPPING INITIATION OF BUS-BAR PROTECTION

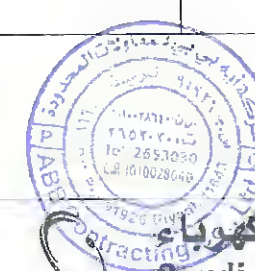
| DISCRIMINATIVE ZONE | | | CHECK ZONE | | | TRIP INITIATE |
|---------------------|-------------------|----------------|--------------------|-------------------|---------------|------------------|
| IN/OUT POSITION | CT SUP. STATUS | TRIP RRELAY | IN/OUT POSITION | CT SET. STATUS | TRIP RELAY | |
| IN | HEALTHY | OPERATED | IN | HEALTHY | OPERATED | YES |
| IN | HEALTHY | OPERATED | OUT | HEALTHY | --- | YES |
| IN | HEALTHY | OPERATED | IN | UNHEALTHY | NOT OPERATED | YES |
| OUT | HEALTHY | - | IN | HEALTHY | OPERATED | YES |
| OUT | HEALTHY | - | OUT | HEALTHY | --- | NO |
| OUT | HEALTHY | - | IN | UNHEALTHY | NOT OPERATED | NO |
| IN | UNHEALTHY | NOT OPERATED | IN | HEALTHY | OPERATED | YES |
| IN | UNHEALTHY | NOT OPERATED | OUT | HEALTHY | --- | NO |
| IN | UNHEALTHY | NOT OPERATED | IN | UNHEALTHY | NOT OPERATED | NO |


Saudi Electricity Company
CTA Projects Department
☐ Approved
☒ Approved with Comments
☐ Disapproved
SYED ZAFRULLA MALGIMAN
 31-07-2012
 DATE 12/91226/12021001
 23-07-2012
 SEC Ref & Date

| | | | | | | | | | |
|----------|-------|-----------------------------------|----------|-------|------------|--------------|------------|------------|----------|
| AS-BUILT | | | BY _____ | | DATE _____ | | | | |
| Ø7 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | DRAWN BY | TSR | CHECKED BY | NSR |
| Ø6 | 12 21 | RVD AS PER SEC REF LETTER # 91001 | NS | NK | AK | DATE STARTED | 06/10/2010 | DATE COMP | |
| Ø5 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | OPRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSNM |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. | | | | |

132KV BBP PHILOSOPHY OF TRIPPING
 PROTECTION LOGIC SINGLE LINE DIAGRAM
 S/S 9020 CONTRACT NO.11033009/00
 RIYADH SAUDI ARABIA

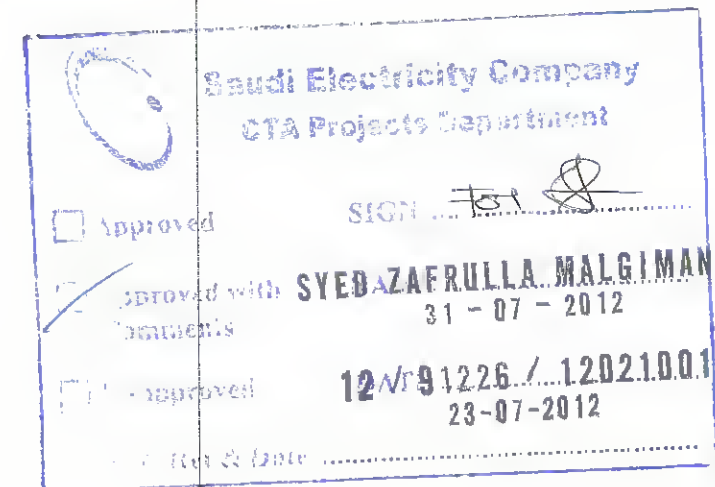
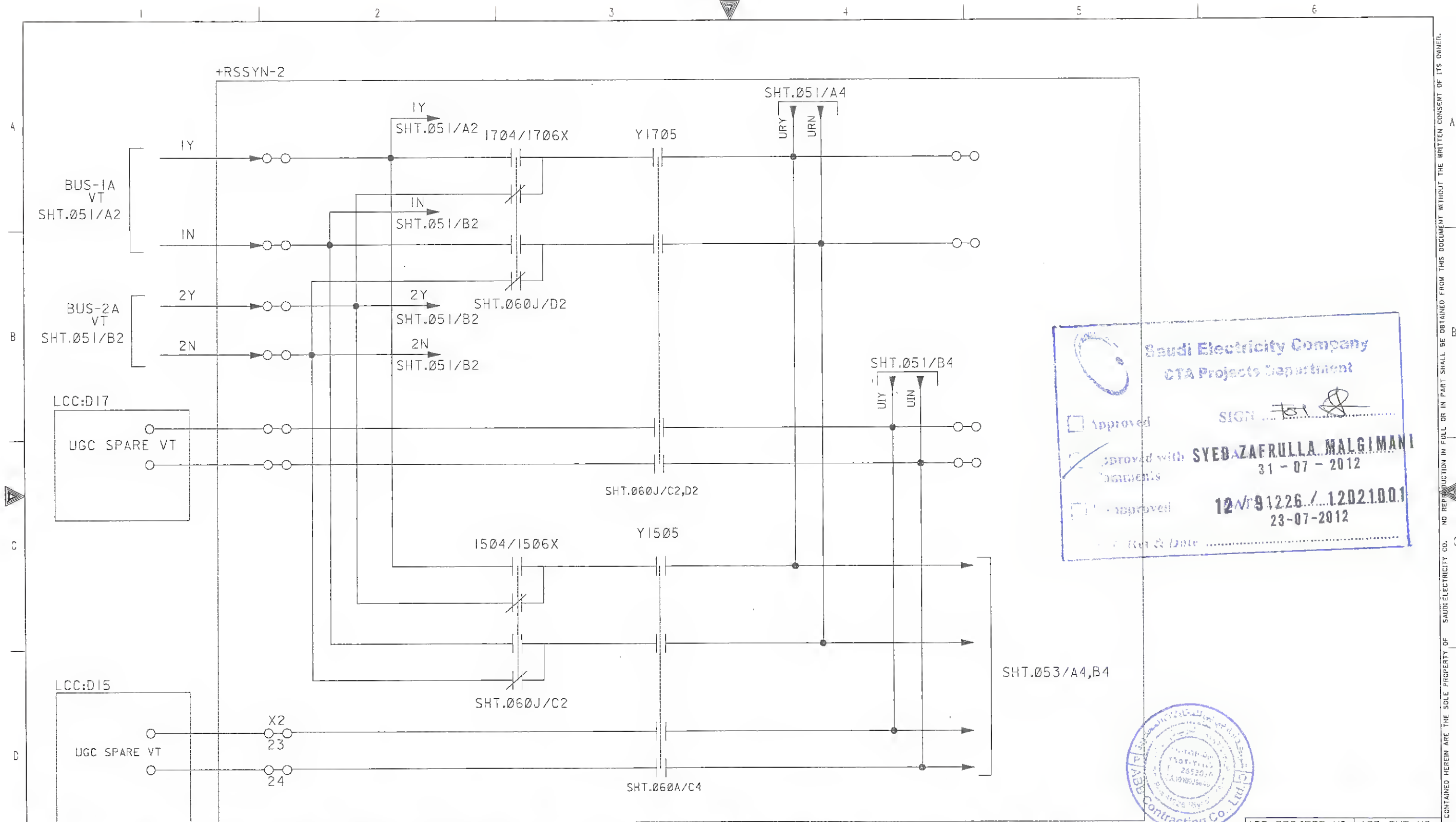
| ABB PROJECT NO. | | ABB SHT NO: | | | |
|-----------------|--|-------------|-----------|----------------|----------|
| S-12926 | | SHEET | CONT. | | |
| | | 050 | 051 | | |
| JOB ORDER NO. | | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | | P | C292 | CD-176662 | 07 |



| ABB PROJECT NO. | ABB SHT NO: |
|-----------------|-------------|
| S-12926 | 050 051 |

الشركة السعودية للكهرباء
Saudi Electricity Company
 SHEET NO. 32 of 54

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



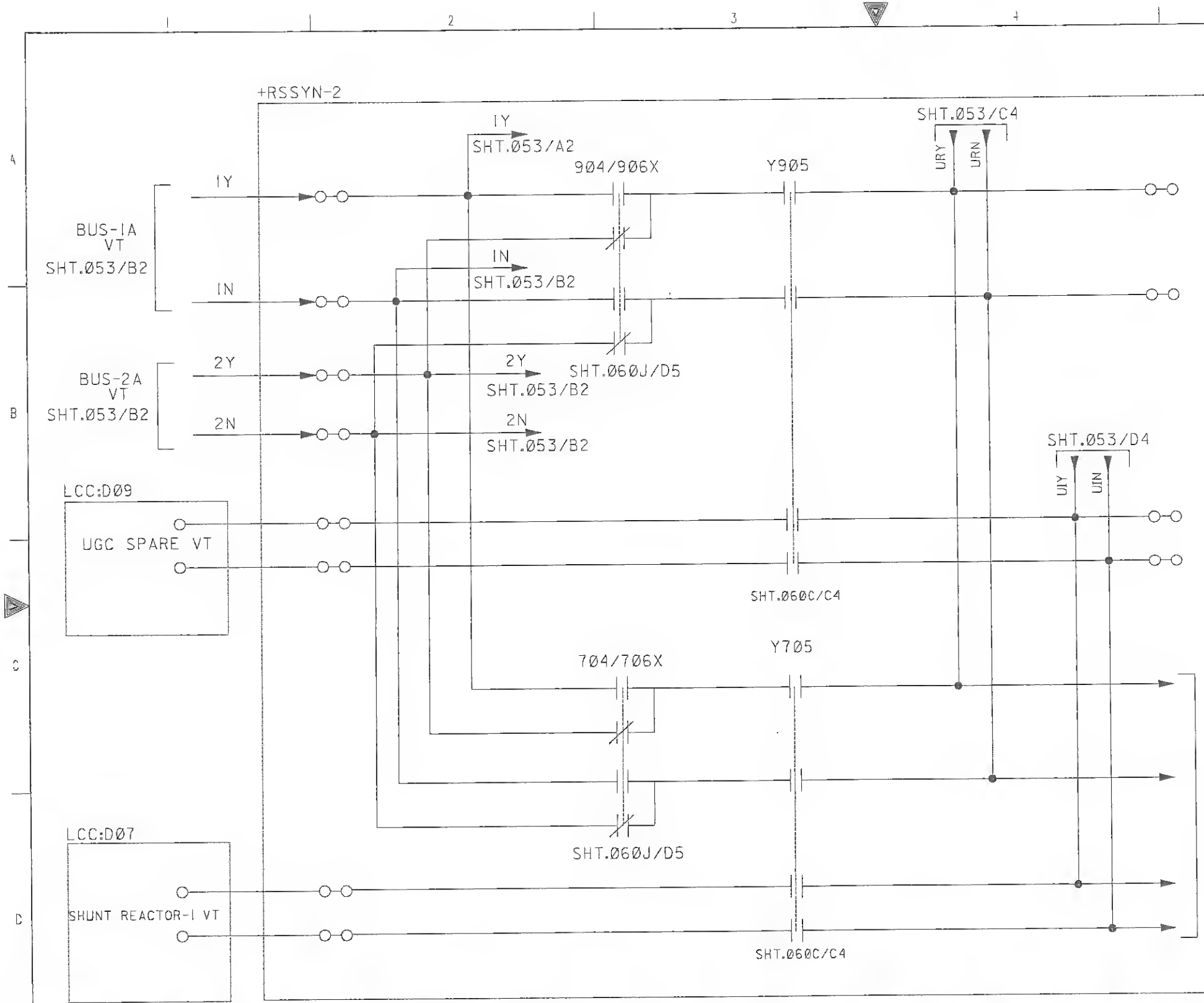
| ABB PROJECT NO. | ABB SHT NO: |
|-----------------|---------------------|
| S-12926 | SHEET 052 CONT. 053 |

| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

| AS-BUILT BY | DATE |
|--|------|
| BY <u>TSR</u> CHECKED BY <u>NSR</u> | |
| DATE STARTED <u>06/10/2010</u> DATE COMP <u></u> | |
| OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSNM</u> | |

| AC CIRCUIT FOR SYSTEM SYNCHRONISER | PROTECTION LOGIC SINGLE LINE DIAGRAM |
|------------------------------------|--------------------------------------|
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
|---------------|-------|-----------|----------------|----------|
| N/A | P | C292 | CD-176662 | 07 |



Saudi Electricity Company
CTA Projects Department

SIGN: *[Signature]*

Checked with **SYED ZAERULLA MALGIMANI**
31-07-2012

12/191226-12021001
23-07-2012

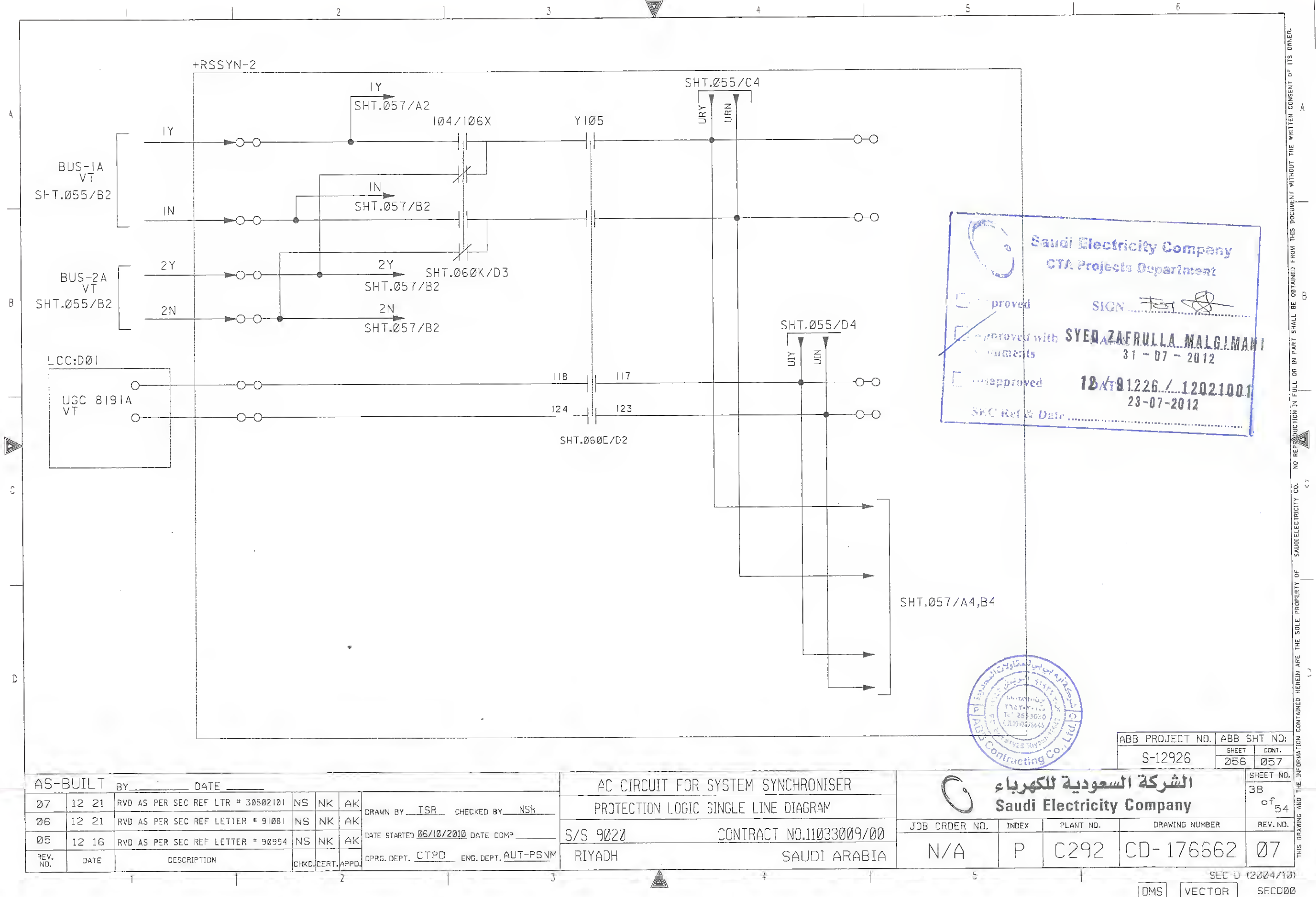


| ABB PROJECT NO. | ABB SHT NO. |
|-----------------|---------------------|
| S-12926 | SHEET 054 CONT. 055 |


| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

| AS-BUILT BY _____ DATE _____ | |
|------------------------------|---------------------|
| DRAWN BY: TSR | CHECKED BY: NSR |
| DATE STARTED: 06/10/2010 | DATE COMP: _____ |
| DPRG. DEPT: CTPD | ENG. DEPT: AUT-PSNM |

| الشركة السعودية للكهرباء Saudi Electricity Company | | | | |
|---|-------|-----------|----------------|----------|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | P | C292 | CD-176662 | 07 |



Saudi Electricity Company
CTA Projects Department

Approved SIGN 

Approved with SYED ZAERULLA MALGIMANI
31-07-2012

Disapproved 12/191226/12021001
23-07-2012

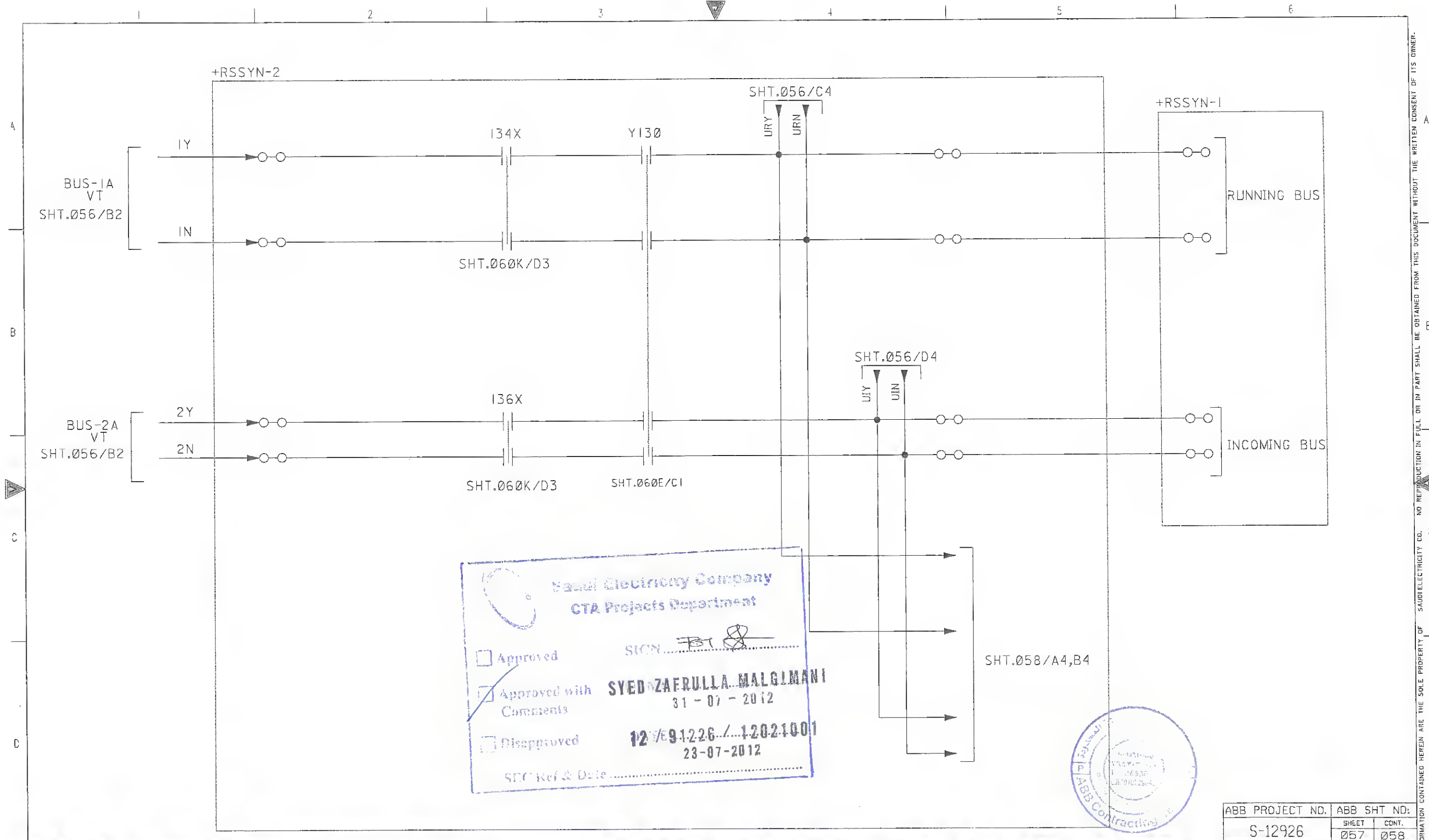
SEC Ref & Date



| AS-BUILT | | | BY | | | DATE | | |
|----------|------|-------------|-----|----|-------|-------|-------|----------------|
| 07 | 12 | 21 | RVD | AS | PER | SEC | REF | LTR # 30502101 |
| 06 | 12 | 21 | RVD | AS | PER | SEC | REF | LETTER # 91081 |
| 05 | 12 | 16 | RVD | AS | PER | SEC | REF | LETTER # 90994 |
| REV. NO. | DATE | DESCRIPTION | | | CHKD. | CERT. | APPD. | |

| AC CIRCUIT FOR SYSTEM SYNCHRONISER | |
|--------------------------------------|-------------------------|
| PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | CONTRACT NO.11033009/00 |
| RIYADH | SAUDI ARABIA |

| الشركة السعودية للكهرباء | | Saudia Electricity Company | |
|--------------------------|-------|----------------------------|----------------|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER |
| N/A | P | C292 | CD-176662 |
| ABB PROJECT NO. S-12926 | | ABB SHT NO: 056 057 | |
| SHEET 38 | | CONT. 54 | |
| REV. NO. 07 | | REV. NO. 07 | |



Saudi Electricity Company
CTA Projects Department

Approved ☐ Approved with Comments ☒ Disapproved ☐

SIGN: SYED ZAERULLA MALGIMANI
31-07-2012

12/E9-1226-1-12021001
23-07-2012

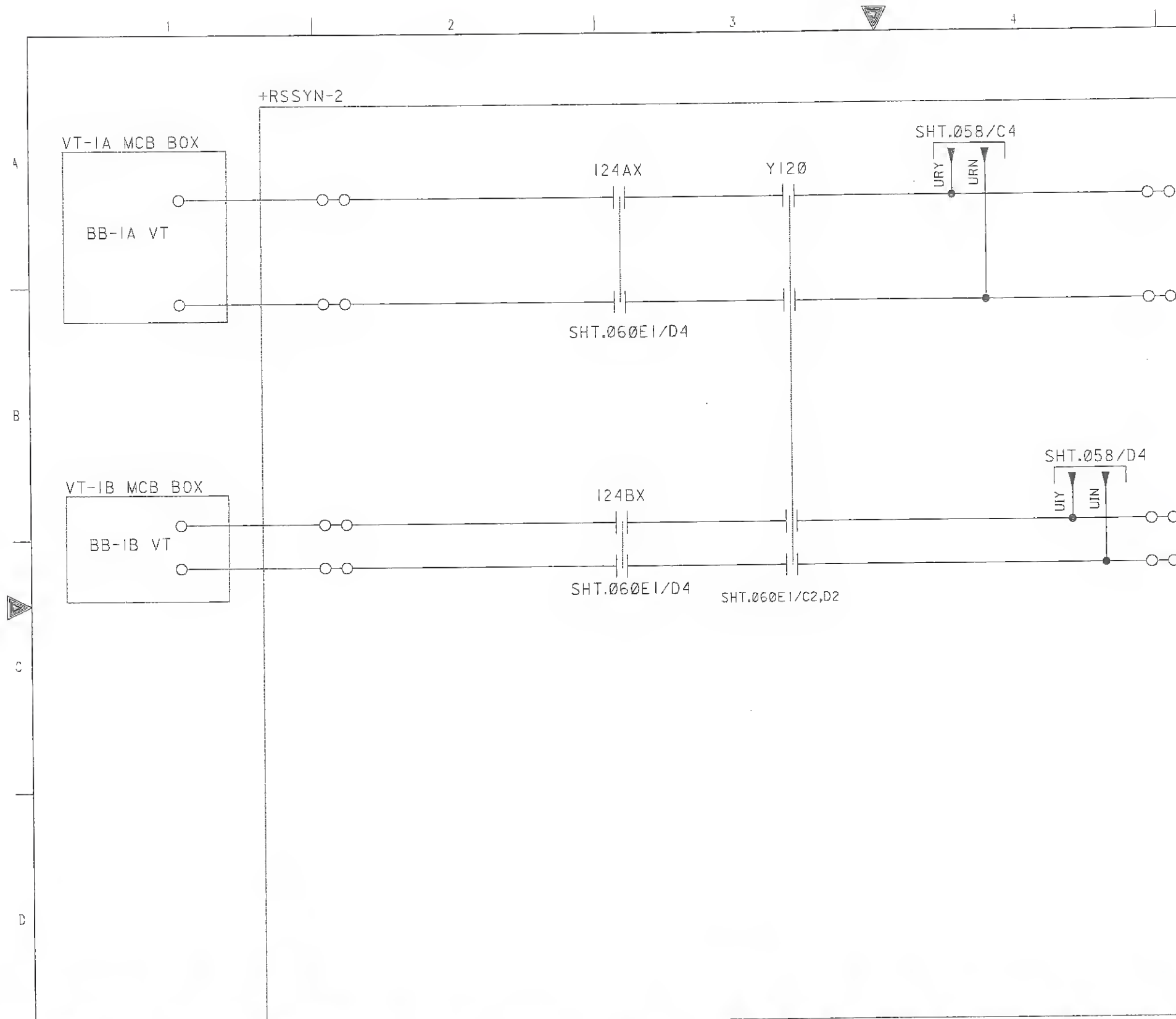
SHT Ref & Date:



| AS-BUILT | | | | BY | | | | DATE | | | |
|----------|------|-------------|-----------------------------------|-------|-------|-------------|------|------------|------------|-----------|--|
| 07 | 12 | 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | TSR | NSR | 06/10/2010 | DATE COMP | |
| 06 | 12 | 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | TSR | NSR | 06/10/2010 | DATE COMP | |
| 05 | 12 | 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | TSR | NSR | 06/10/2010 | DATE COMP | |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. | OPRG. DEPT. | CTPD | ENG. DEPT. | AUT-PSNM | | |

| AC CIRCUIT FOR SYSTEM SYNCHRONISER | | | | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | |
|------------------------------------|--------------|-------------|--------------|--------------------------------------|--------------|-----|---|
| S/S 9020 | CONTRACT NO. | 11033009/00 | SAUDI ARABIA | RIYADH | SAUDI ARABIA | N/A | P |

| الشركة السعودية للكهرباء | | | | Saudi Electricity Company | | | |
|--------------------------|-------|-----------|----------------|---------------------------|----|----|----|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. | 07 | 07 | 07 |
| N/A | P | C292 | CD-176662 | 07 | 07 | 07 | 07 |



Saudi Electricity Company
CTA Projects Department

☐ Approved with Comments
☒ Approved
☐ Not Approved

SIGN:
NAME: **SYED ZAFRULLA MALTIMANI**
DATE: **31-07-2012**
SHT.058/D4
SHT.058/C4
SHT.060E1/D4
SHT.060E1/C2,D2



| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |

AS-BUILT BY: _____ DATE: _____

DRAWN BY: TSR CHECKED BY: NSR

DATE STARTED: 06/10/2010 DATE COMP: _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM

AC CIRCUIT FOR SYSTEM SYNCHRONISER
PROTECTION LOGIC SINGLE LINE DIAGRAM

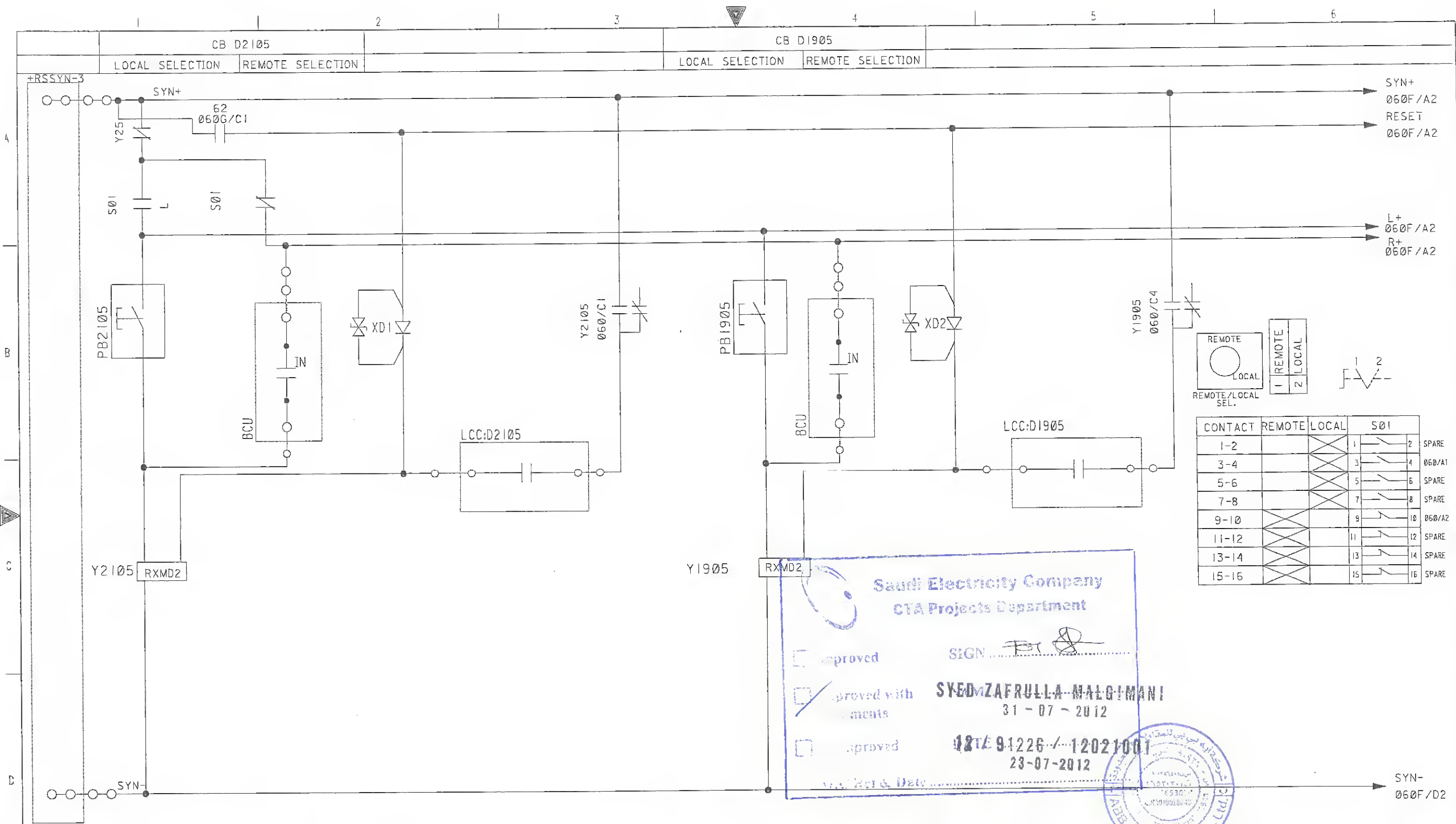
S/S 9020 CONTRACT NO. 11033009/00
RIYADH SAUDI ARABIA

| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
|---------------|-------|-----------|----------------|----------|
| N/A | P | C292 | CD-176662 | 07 |

| ABB PROJECT NO. | ABB SHT NO. |
|-----------------|-------------|
| S-12926 | 059 060 |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



| REMOTE | | LOCAL | |
|-------------------|--------|-------|-----------|
| 1 | REMOTE | 2 | LOCAL |
| REMOTE/LOCAL SEL. | | | |
| CONTACT | REMOTE | LOCAL | S01 |
| 1-2 | | | 2 SPARE |
| 3-4 | | | 4 060/A1 |
| 5-6 | | | 6 SPARE |
| 7-8 | | | 8 SPARE |
| 9-10 | | | 10 060/A2 |
| 11-12 | | | 12 SPARE |
| 13-14 | | | 14 SPARE |
| 15-16 | | | 16 SPARE |

Saudi Electricity Company
CTA Projects Department

Approved SIGN:

Approved with comments **SYED ZAFARULLAH M. AL-GHAMDI**
31-07-2012

Approved **42E 91226 / 12021001**
23-07-2012

Stamp: ABB Contracting Co. Ltd.

| AS-BUILT | | BY | | DATE | |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91001 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |

DRAWN BY: TSR CHECKED BY: NSR
DATE STARTED: 06/10/2010 DATE COMP:
OPRG. DEPT.: CTPD ENG. DEPT.: AUT-PSNM

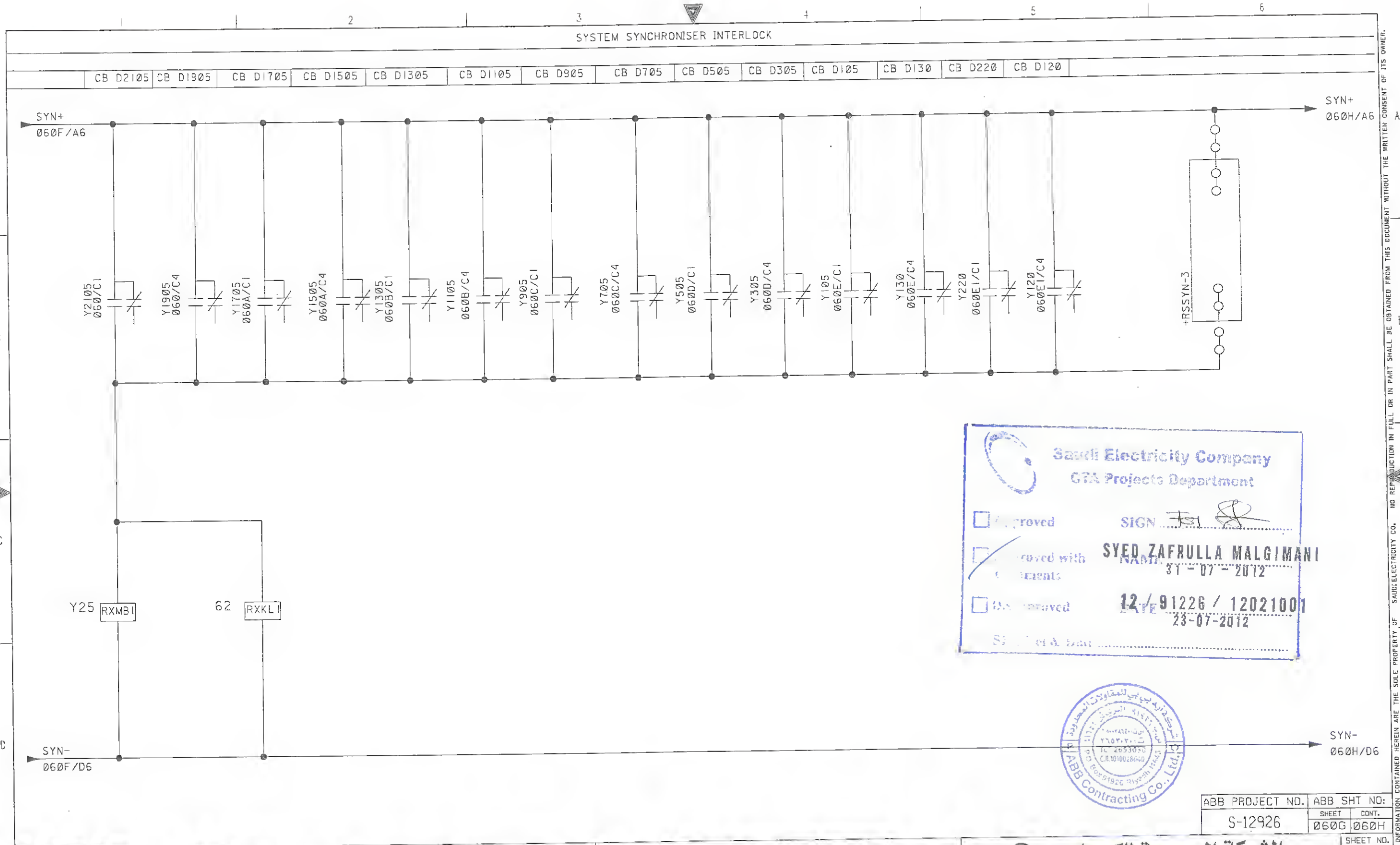
DC LOGIC SYSTEM SYNCHRONISER
PROTECTION LOGIC SINGLE LINE DIAGRAM
S/S 9020 CONTRACT NO. 11033009/00
RIYADH SAUDI ARABIA

الشركة السعودية للكهرباء
Saudi Electricity Company

ABB PROJECT NO. S-12926 ABB SHT NO. 060 060F

JOB ORDER NO. N/A INDEX P PLANT NO. C292 DRAWING NUMBER CD-176662 REV. NO. 07

SHEET NO. 42 of 54



| AS-BUILT BY _____ DATE _____ | | | | | |
|------------------------------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |

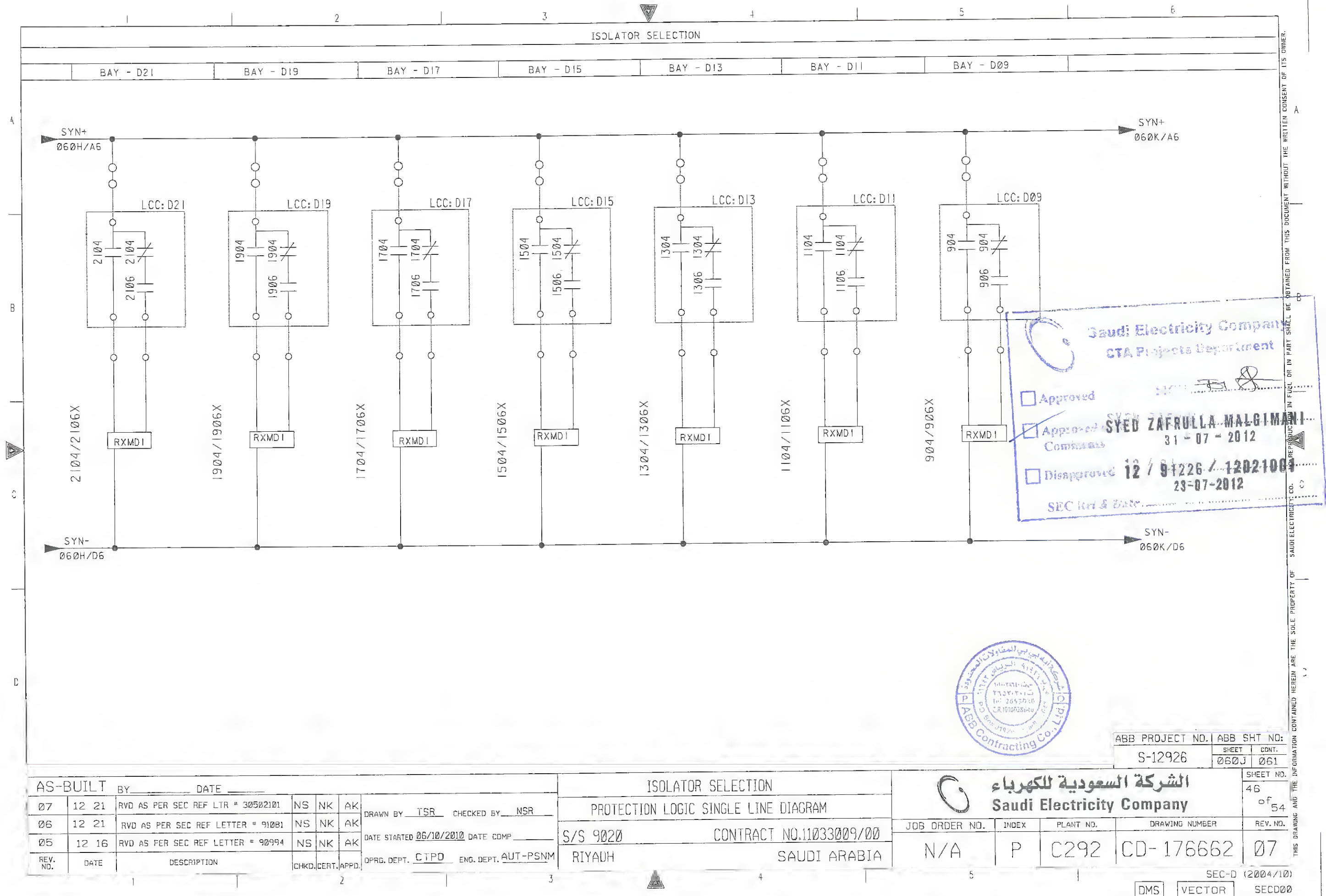
DRAWN BY TSR CHECKED BY NSR
 DATE STARTED 06/10/2010 DATE COMP _____
 OPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM

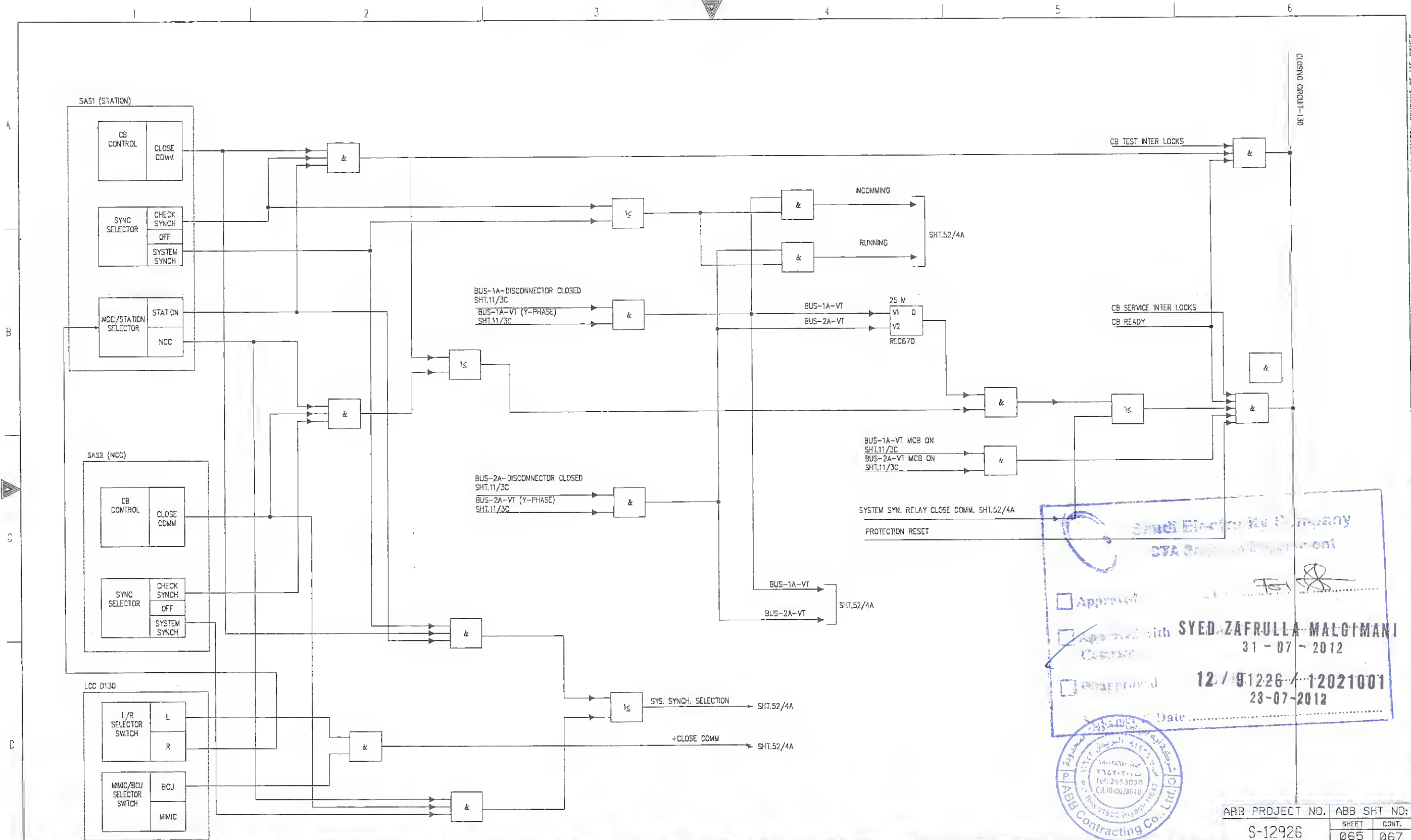
SYSTEM SYNCHRONISER INTERLOCK
 PROTECTION LOGIC SINGLE LINE DIAGRAM
 S/S 9020 CONTRACT NO. 11033009/00
 RIYADH SAUDI ARABIA

| الشركة السعودية للكهرباء Saudi Electricity Company | | | | |
|---|-------|-----------|----------------|----------|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | P | C292 | CD-176662 | 07 |

| ABB PROJECT NO. | ABB SHT NO: |
|-----------------|-----------------------------------|
| S-12926 | SHEET 44 of 54 CONT. 060G 060H |

SEC-D (2004/10)
 DMS VECTOR SECD00





Saudi Electricity Company
STA Project Department

☐ Approved
☒ Approved with **SYED ZAFRULLA MALGIMANI**
 31-07-2012
☐ Approved
 12/01226-12021001
 23-07-2012

Date

Saudi Electricity Company
 P.O. Box 91820 Riyadh 11613
 Tel: 2653030
 C.A. 1010028640

| AS-BUILT BY _____ DATE _____ | | | | | | |
|------------------------------|-------|-----------------------------------|-------|-------|-------|--|
| Ø7 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK | |
| Ø6 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | |
| Ø5 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. | |

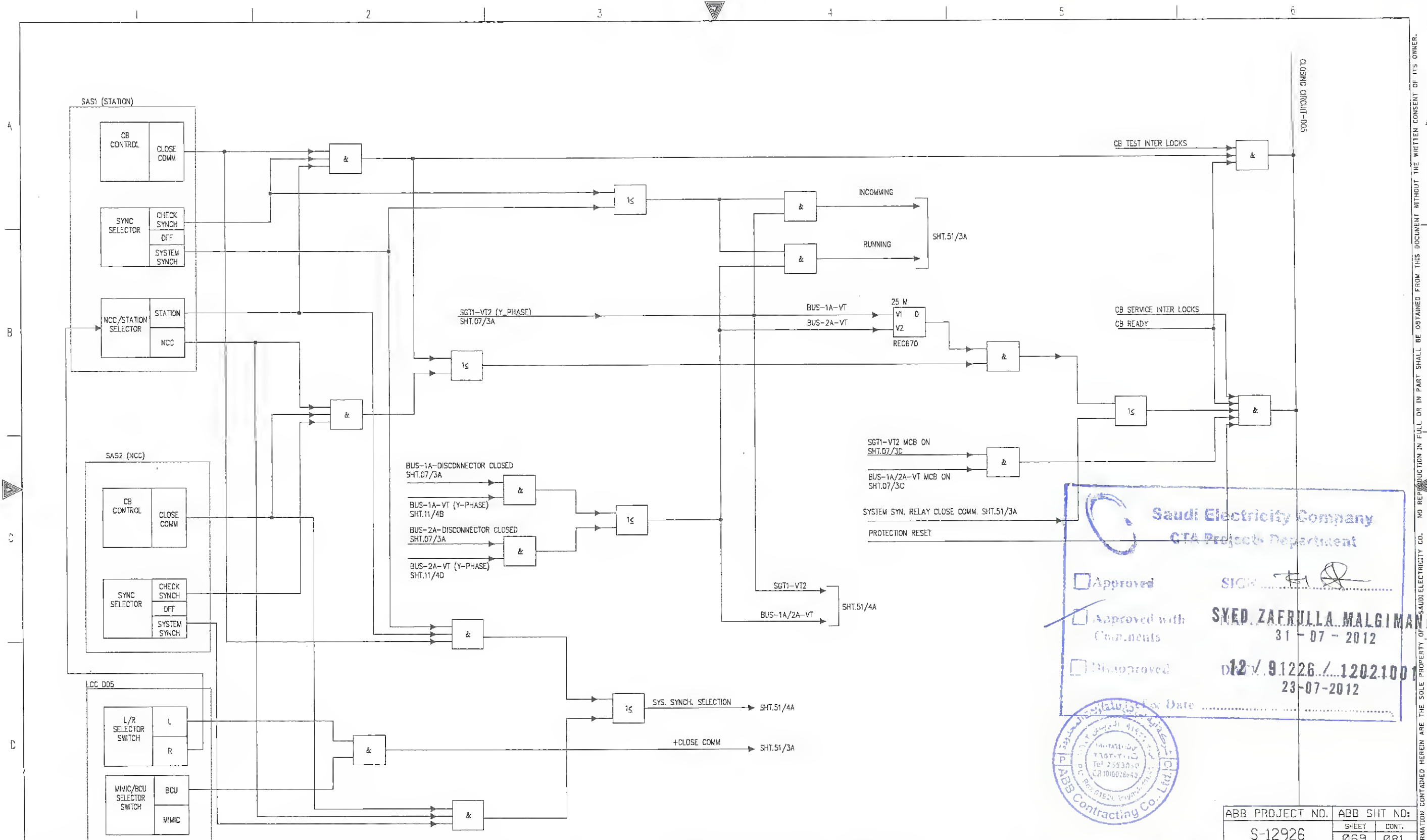
| | |
|--|----------------------------|
| DRAWN BY <u>TSR</u> CHECKED BY <u>NSR</u> | |
| DATE STARTED <u>06/10/2010</u> DATE COMP _____ | |
| PRG. DEPT. <u>CTPD</u> | ENG. DEPT. <u>AUT-PSNM</u> |

| | | | |
|-----------------------------|--|--------------------------------------|--|
| BUS COUPLER-1 CLOSING LOGIC | | PROTECTION LOGIC SINGLE LINE DIAGRAM | |
| S/S 9020 | | CONTRACT NO.11033009/00 | |
| RIYADH | | SAUDI ARABIA | |

| | | | | |
|---------------|-------|-----------|----------------|----------|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | P | C292 | CD-176662 | Ø7 |

| | |
|-----------------|-------------|
| ABB PROJECT NO. | ABB SHT NO: |
| S-12926 | 065 067 |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



Saudi Electricity Company
CTA Projects Department

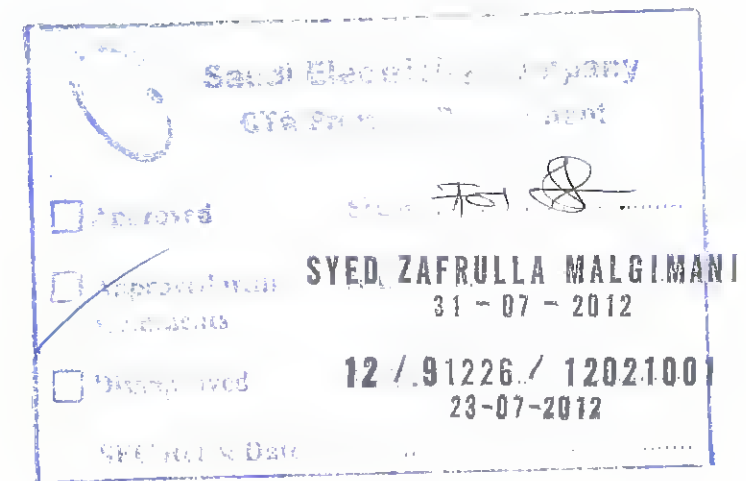
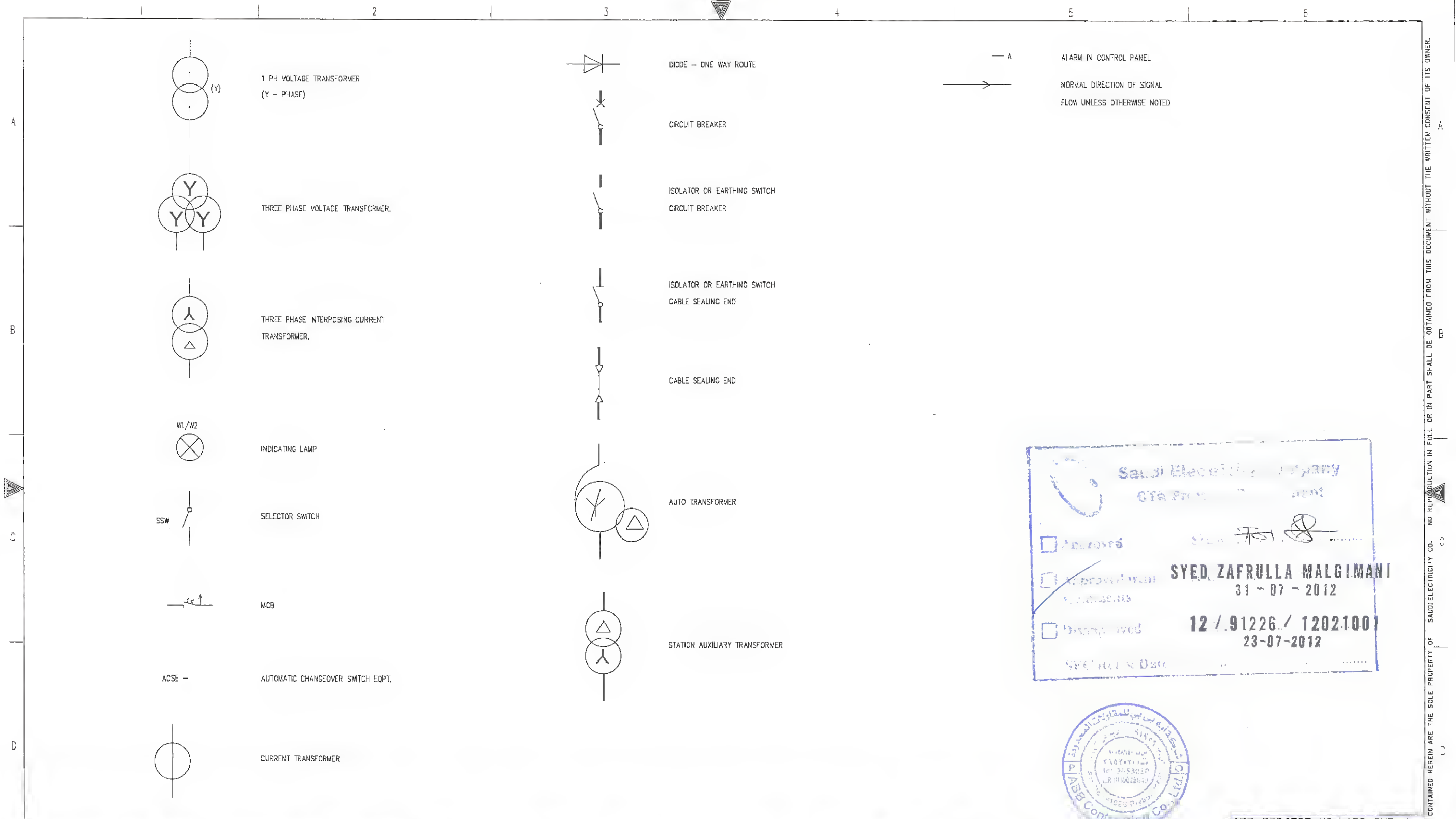
☐ Approved
☒ Approved with Comments
☐ Disapproved

SIGN: *[Signature]*
SYED ZAERULLA MALGIMANI
 31-07-2012
 012/91226 / 12021001
 23-07-2012

Date: _____
 ABB Contracting Co. Ltd.

| | | | | | | | | | | | | | | | | | | | |
|--|-------|------------------------------------|----|----|----|--------------------------------------|--|--|--|---------------------------|--|--|--|-------------------------|--|-----------------------|--|--------------------|--|
| AS-BUILT BY _____ DATE _____ | | | | | | 132kV SIDE OF SGT-1 CLOSING LOGIC | | | | الشركة السعودية للكهرباء | | | | ABB PROJECT NO. S-12926 | | ABB SHT NO. 069 / 081 | | SHEET NO. 50 of 54 | |
| DRAWN BY <u>TSR</u> CHECKED BY <u>NSR</u> | | | | | | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | | Saudi Electricity Company | | | | JOB ORDER NO. N/A | | INDEX P | | PLANT NO. C292 | |
| DATE STARTED <u>06/10/2010</u> DATE COMP _____ | | | | | | S/S 9020 | | | | CONTRACT NO.11033009/00 | | | | DRAWING NUMBER | | CD-176662 | | REV. NO. 07 | |
| DPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSNM</u> | | | | | | RIYADH | | | | SAUDI ARABIA | | | | DMS | | VECTOR | | SECD00 | |
| REV. NO. DATE DESCRIPTION CHKD. CERT. APPD. | | | | | | | | | | | | | | | | | | | |
| 07 | 12 21 | RVD AS PER SEC REF. LTR # 30502101 | NS | NK | AK | | | | | | | | | | | | | | |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK | | | | | | | | | | | | | | |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK | | | | | | | | | | | | | | |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|-----------------|--|---|--|-----------|--|--|--|---------|--|----------------|--|--------------------------|--|-------------|--|
| | | | | | | | | | | ABB PROJECT NO. S-12926 | | ABB SHT NO. 081 | | SHEET 082 | | CONT. 082 | | THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS THE PROPERTY OF THE COMPANY AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM THE COMPANY. | | | | | | | | | |
| AS-BUILT BY _____ DATE _____ | | | | | | | | | | 132KV PROTECTION DEVICES NOMENCLATURES | | | |  الشركة السعودية للكهرباء Saudi Electricity Company | | | | SHEET NO. 51 of 54 | | | | | | | | | |
| 07 12-21 RVD AS PER SEC REF LTR # 30502101 NS NK AK | | | | | | | | | | DRAWN BY _____ TSR CHECKED BY _____ NSR | | | | PROTECTION LOGIC SINGLE LINE DIAGRAM | | | | JOB ORDER NO. N/A | | INDEX P | | PLANT NO. C292 | | DRAWING NUMBER CD-176662 | | REV. NO. 07 | |
| 06 12-21 RVD AS PER SEC REF LETTER # 91081 NS NK AK | | | | | | | | | | DATE STARTED 06/10/2010 DATE COMP. _____ | | | | S/S 9020 CONTRACT NO.11033009/00 | | | | | | | | | | | | | |
| 05 12-16 RVD AS PER SEC REF LETTER # 90994 NS NK AK | | | | | | | | | | DPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM | | | | RIYADH SAUDI ARABIA | | | | | | | | | | | | | |
| REV. NO. DATE DESCRIPTION CHKD. CERT. APPD. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 2 3 4 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.

| | | | | | |
|-----------------------|--|---------------------|--|--|---|
| A | AMMETER | VARH | VARHOUR METER | 27F | FUSE FAILURE RELAY |
| | CURRENT TRANSDUCER | WH | WATTHOUR METER | 49T | TRANSFORMER WDG. TEMP. HIGH TRIP |
| | AMMETER / VOLTMETER SELECTOR SWITCH | & | 'AND' LOGIC GATE | 49W | TRANSFORMER WDG. TEMP. HIGH ALARM |
| BB,PR-1A IN OUT | BUSBAR PROTECTION - 1A IN/OUT | I< | 'OR' LOGIC GATE | 51/51N 2 I > 1 > | IDMTL NON-DIRECTIONAL 2PH OVER CURRENT & EARTH FAULT RELAY. |
| DV | DUAL SCALE VOLTMETER | (0-1S) 2 | TIME DELAY RELAY, 0-1S RANGE. | 50/50N 51/51N 3 I > 3 I >> 1 I > 1 I >> | IDMTL NON DIRECTIONAL 3PHASE OVERCURRENT & EARTH FAULT RELAY |
| DF | DUAL SCALE FREQUENCY METER | 21 I 0 Z < | DISTANCE PROTECTION RELAY | 51NDT I 0 I + T | DEFINITE TIME EARTHFALT RELAY |
| BT | BACK TRIP LINK | 23 | TRANSFORMER COOLIER FAIL | 51NA I 0 In | TRANSFORMER NEUTRAL CURRENT E/F ALARM RELAY. |
| FUSE | FUSE | 25(A) V1 0 V2 | SYNCHRO CHECK RELAY WITH VOLTAGE CHECK UNIT. (FOR AUTO RECLOSE) | 51S/51NS I 0 In | TRANSFORMER L.V. D/C & E/F RELAY. |
| ER | FAULT RECORDER | 25(M) V1 0 V2 | SYNCHRO CHECK RELAY WITH VOLTAGE CHECK UNIT. (FOR MANUAL SYNCHRONISATION) | 50+62CBF-1, 50+62CBF-2 I 0 | CIRCUIT BREAKER FAIL RELAY-1/2 |
| 9/5A | REFERENCE, SHEET-9, LOCATION-5A | 26D-1 | MAIN TRANSFORMER OIL TEMP. HIGH (STAGE 1) | 50P/51P I 0 3 I > 3 I >> 1 I > 1 I >> | TRANSFORMER H.V. D/C INST/IDMT |
| MDI | MAXIMUM DEMAND AMMETER | 26D-2 | MAIN TRANSFORMER OIL TEMP. HIGH (STAGE 2) | 51N I 0 In | TRANSFORMER STAND BY EARTH FAULT RELAY. |
| MVAR | MEGA VAR METER | 26S | TRANSFORMER FIRE PROTECTION OPERATED (SERG) | 50/51/50N/51NT 3 I > 3 I >> 1 I > 1 I >> | 3 PH D/C & E/F RELAY (IDMTL & INSTANTANEOUS) |
| MVAR | MEGA VAR TRANSDUCER | 27B I 0 U < | BUS UNDER-VOLTAGE RELAY | 50/51ET I 0 I > I >> | INSTANTANEOUS CURRENT CHECK RELAY EARTHING TRANSFORMER |
| MW | MEGA WATTMETER | 27TC-1 I 0 | TRIP COIL - 1 SUPERVISION RELAY. | | |
| MW | MEGA WATT TRANSDUCER | 27TC-2 I 0 | TRIP COIL - 2 SUPERVISION RELAY. | | |
| S | SYNCHROSCOPE | 27L I 0 U < | LINE UNDER VOLTAGE RELAY | | |
| SY | FEEDER SELECTOR SWITCH FOR MANUAL SYNCHRONISING | | | | |
| V | VOLTMETER | | | | |
| V | VOLTAGE TRANSDUCER | | | | |

Saudi Electricity Company
STA Projects Department

Approved _____
Approved with Comments _____
Disapproved _____

SYED. ZAFERULLA MALOUMANI
31-07-2012

12 / 9.1226 / 12021001
23-07-2012

Sh.C Ret. Date _____



| | | | | | | | | | | | | | |
|---|--|--|--|--|--|---|--|--|--|---|--|--|--|
| AS-BUILT BY _____ DATE _____ | | | | | | 132KV PROTECTION DEVICES NOMENCLATURES | | | | الشركة السعودية للكهرباء Saudi Electricity Company | | | |
| 07 12 21 RVD AS PER SEC REF LTR # 30502101 NS NK AK 06 12 21 RVD AS PER SEC REF LETTER # 91081 NS NK AK 05 12 16 RVD AS PER SEC REF LETTER # 90994 NS NK AK | | | | | | DRAWN BY TSR CHECKED BY NSR DATE STARTED 06/10/2010 DATE COMP. _____ OPRG. DEPT. CTPD ENG. DEPT. AUT-PSNM | | | | SHEET 52 of 54 JOB ORDER NO. N/A INDEX P PLANT NO. C292 DRAWING NUMBER CD-176662 REV. NO. 07 | | | |
| REV. NO. DATE DESCRIPTION CHKD. CERT. APPD. | | | | | | PROTECTION LOGIC SINGLE LINE DIAGRAM S/S 9020 CONTRACT NO.110333009/00 RIYADH SAUDI ARABIA | | | | SEC-D (2004/10) DMS VECTOR SECD00 | | | |

| SN. | NOMENCLATURE | PROTECTIVE FUNCTION | RELAY TYPE | MAKE |
|-----|---------------------------------------|--|-------------------|---------|
| 1 | B7L | LINE DIFFERENTIAL RELAY MAIN PROTECTION-1 | RED670 | ABB |
| 2 | 21/67N | DISTANCE AND NON DIRECTIONAL O/C & E/F RELAY | 7SA522 | SIEMENS |
| 3 | 50BF+62BF-1(BC+BS+SHR+SGT) | CIRCUIT BREAKER FAILURE | REF615 | ABB |
| 4 | 50BF+62BF-2(BS+BC+SGT+SHR) | CIRCUIT BREAKER FAILURE | P141 | AREVA |
| 5 | 25 - SYSTEM SYNC | SYNCHROCHECK RELAY | SYNCHRO TACT 5201 | ABB |
| 6 | 27 TC1 | TRIP COIL SUPERVISION | SPER1C1 | ABB |
| 7 | 27 TC2 | TRIP COIL SUPERVISION | MVAX 31 | AREVA |
| 8 | 50BF+62BF-1(SPARE BAYS) | CIRCUIT BREAKER FAILURE | REF615 | ABB |
| 9 | 50BF+62BF-2(SPARE BAYS) | CIRCUIT BREAKER FAILURE | P141 | AREVA |
| 10 | B7C1/95C1, B7R/95R | TEE PROTECTION MAIN-1 | REC670 | ABB |
| 11 | B7C2, B7C | TEE PROTECTION MAIN-2 | P141 | AREVA |
| 12 | 59 | VOLTAGE RELAY | REF615 | ABB |
| 13 | 62 | TIME DELAY RELAY | RXKL1 | ABB |
| 14 | 95 (SGT,SHR) | CT SUPERVISION RELAY | RAEDK3 | ABB |
| 15 | 50P/51P | TRANSFORMER HV O/C PROTECTION RELAY | REF615 | ABB |
| 16 | 51NA | TERTIARY BACK UP E/F PROT. | REF615 | ABB |
| 17 | B7T1 | TRANSFORMER DIFFL RELAY MAIN PROTECTION-1 | RET670 | ABB |
| 18 | B5R | INTERTRIP RECEIVE | MVAJ101 | ABB |
| 19 | B6 | TRIP UNIT | MVAJ105 | AREVA |
| 20 | B7B/95B(BB-1,BB-1B,BB-2A,BB-2B & CHZ) | HIGH IMPEDANCE BUSBAR RELAY | REC670 | ABB |
| 21 | B7T2 | TRANSFORMER DIFFL RELAY MAIN PROTECTION-2 | P-633 | AREVA |
| 22 | 74 7 FLAG RELAYS (GT) | DC SUPERVISION RELAY | RXSF1 | ABB |
| 23 | AUX RELAY | | RXMB1 | ABB |
| 24 | HIGH SPEED TRIP RELAY (GT) | | RXMS1 | ABB |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Saudi Electricity Company
CTA Projects Department

SIGN 

SYED ZAFRULLA MALGIMANI
31-07-2012

12/09/2012 12:26 / 1202100
23-07-2012



| | |
|-----------------|---------------------|
| ABB PROJECT NO. | ABB SHT NO: |
| S-12926 | SHEET 084 CONT. NIL |

AS-BUILT BY _____ DATE _____

| | | | | | |
|----------|-------|-----------------------------------|-------|-------|-------|
| 07 | 12 21 | RVD AS PER SEC REF LTR # 30502101 | NS | NK | AK |
| 06 | 12 21 | RVD AS PER SEC REF LETTER # 91081 | NS | NK | AK |
| 05 | 12 16 | RVD AS PER SEC REF LETTER # 90994 | NS | NK | AK |
| REV. NO. | DATE | DESCRIPTION | CHKD. | CERT. | APPD. |

DRAWN BY ISR CHECKED BY NSR

DATE STARTED 06/10/2010 DATE COMP _____

ORIG. DEPT. CTPD ENG. DEPT. AUT-PSNM

132KV PROTECTION DEVICES NOMENCLATURES

PROTECTION LOGIC SINGLE LINE DIAGRAM

S/S 9020

CONTRACT NO.11033009/00

RIYADH

SAUDI ARABIA



الشركة السعودية للكهرباء
Saudi Electricity Company

| | | | | |
|---------------|-------|-----------|----------------|----------|
| JOB ORDER NO. | INDEX | PLANT NO. | DRAWING NUMBER | REV. NO. |
| N/A | P | C292 | CD-176662 | 07 |

SEC-D (2004/10)

DMS VECTOR SECD00

THIS DRAWING AND THE INFORMATION CONTAINED HEREIN ARE THE SOLE PROPERTY OF SAUDI ELECTRICITY CO. NO REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.